ARCHAEOLOGICAL EXCAVATIONS AT FORT VANCOUVER NATIONAL HISTORIC SITE 1999: NEW OFFICE, WATERLINE, AND STOCKADE INVESTIGATIONS

by

Douglas C. Wilson, Ph.D.

for

National Park Service
Columbia Cascades Support Office

May 4, 2000

ARCHÆOLOGY consulting

Report No. 12

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ABSTRACT

Between October 18, 1999, and November 23, 1999, Archaeology Consulting conducted excavations at Fort Vancouver National Historic Site in three separate investigations. The *New Office Investigation* consisted of six 5 x 5-ft. data recovery units and two exploratory test excavations in the interior of the fort stockade at the location of the 1845 "New Office." The *Waterline Investigation* consisted of one 5 x 5-ft. unit excavated to mitigate the effects of a proposed waterline immediately behind the Bakehouse and outside the stockade wall. In the *Stockade Investigation*, two 5 x 5-ft. units were excavated at the northeast corner of the stockade wall to determine the extent of the concrete footing that reinforces the stockade pickets. A total of 275 ft^2 (25.5 m^2) was excavated during the three investigations.

Nine features were recorded, including the remaining portions of three Hudson's Bay Company footing features associated with the New Office, two refuse features dating to the period of occupation of the New Office, various U.S. Army period features, including remnants of the 1918 Spruce Mill slash burner, and trenches and units associated with previous archaeological excavations. A total of 5,587 artifacts was recovered, including numerous fragments of ceramic and glass vessels, flat glass, nails, bricks, and wood.

The results of the analysis of architectural remains suggest that between two and four windows were present on the north wall of the New Office. There is no evidence for a door. Sheet trash and a secondary refuse dump were identified on the edges of the building. The largest numbers of artifacts were recovered in the dump area, located in the east-central portion of the north wall of the New Office. This dump contained a variety of materials, some of which may derive from the use of the New Office.

Combined with the previous excavations, the entire area of the New Office site and the utility corridor for the proposed reconstruction have been archaeologically excavated. Portions of the eastern part of the utility corridor defined by Ross should be avoided, as intact archaeological deposits are probably still located there. The location of the New Office site and previous archaeological excavations has been field-verified and the northeast and southeast corners have been relocated. The excavations have mitigated the proposed expansion of the water box and have defined the construction trench associated with the 1966 reconstruction in the northeast corner of the stockade. This trench extends 2 ft. (61 cm) east of the concrete footing in Unit 2, but only about 0.5 ft. (15 cm) west of the concrete footing in Unit 3. Substantial numbers of artifacts were recovered from the Stockade Investigation units. The amount of materials and the significance of the materials, suggest that monitoring of trenching across previously disturbed areas, including archaeologically excavated areas, may yield valuable artifacts of interest to researchers.

ACKNOWLEDGMENTS

The author would like to thank David Hansen, Fort Vancouver National Historic Site (FOVA) Museum Curator/Historian, Jim Thomson, Columbia Cascades Support Office (CCSO) Archaeologist, and Stephanie Toothman, CCSO Cultural Resources Director, for their overall input and advice regarding this project. David Hansen served as the Contracting Officer's Representative, with Lynne E. McPhaden as the Contracting Officer. The project was conducted under Purchase Order No. P9430990003. Laurin Huffman, CCSO Historical Architect, provided valuable input and comments on data needs associated with the New Office reconstruction. Keith Garnett, Applied Geographer, was invaluable in locating and interpreting the excavation units and provided the excavation site maps for the project. His interpretive and data collection skills have resulted in a precise identification of the location of the New Office and Jail sites, and have helped to untangle the spatial errors associated with previous excavations in the area.

Gary Bickford, Chief of Maintenance at FOVA, ably assisted by Lauren Wright, provided barricades, hazard tape, and assistance in locating and defining the areas for excavation. They graciously moved the privy structure so we could excavate Unit 3 and backfilled all of the units after the project was completed. The entire field crew thanks them for this.

The field crew consisted of Christina Aucutt, Melissa Cole Darby, David DeLyria, Krey Easton, Erin Kester, and Theresa Langford. Doris Manley provided photographic assistance, while Dan Martin and Ward Upson provided valuable volunteer efforts. Many thanks go to Theresa, Melissa, and Dan, who freely shared their previous excavation experiences at Fort Vancouver. Thanks go to Dr. Virginia Butler and her archaeology class, who visited the site one rainy day and helped screen.

Christina Aucutt and Theresa Langford conducted most of the laboratory cleaning. Many thanks to David Hansen, Doug Magedanz and Theresa Langford, who provided indispensable assistance on 19th century material culture and elucidated the previous analytical frameworks employed at Fort Vancouver.

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INTRODUCTION

Between October 18, 1999, and November 23, 1999, Archaeology Consulting conducted excavations at Fort Vancouver National Historic Site in three separate investigations. The *New Office Investigation* consisted of six 5 x 5-ft. data recovery units and two exploratory test excavations in the interior of the fort stockade at the location of the 1845 "New Office" (Figure 1). The *Waterline Investigation* consisted of one 5 x 5-ft. unit excavated to mitigate the effects of a proposed waterline immediately behind the Bakehouse and outside the stockade wall (Figure 2). The *Stockade Investigation* consisted of two 5 x 5-ft. units excavated at the northeast corner of the stockade wall to determine the extent of the concrete footing that reinforces the stockade pickets (Figure 2). A total of 275 ft^2 (25.5 m^2) was excavated.

RESEARCH DESIGN

Plans to reconstruct the 1845 New Office required full archaeological data recovery of the New Office site, including a proposed utility corridor from the stockade to the northeast corner of the proposed building. The 1999 excavations were designed to insure that the entire area of the New Office site and the utility corridor had been archaeologically excavated. The primary scientific goal of the investigations was to provide architectural evidence with which to more accurately reconstruct the building. Particular importance was given to the presence and concentration of architectural features and related artifacts, including nails, flat (window) glass, wooden objects, bricks and other construction materials. Another goal was to attempt to identify and collect samples from the 1894 flood deposit, which is found sporadically across the site. Identification of this deposit is important in assessing the identity and integrity of Hudson's Bay Company and early U.S. Army deposits.

FORMATION PROCESSES

The key to understanding the artifacts recovered from excavations at Fort Vancouver in the context of construction, use, and maintenance of structures and exterior work areas, is to identify and interpret the refuse disposal behaviors and post-depositional disturbance processes extant at the fort. A subsidiary goal of the New Office excavations, and one that was complementary to the architectural analysis, was to identify and interpret formation processes extant at the site (Shiffer 1987). This analysis was designed to identify and interpret the disposal patterns associated with the New Office site with the aim to assist in the determination of artifact origin and functional associations with the structure. An important goal was to determine which objects were discarded at their place of use as *primary refuse* from those that were discarded elsewhere as *secondary refuse*. Further, the transformation of archaeological materials through trampling, burning, disturbance by previous archaeological excavations, and other natural and cultural formation processes, were addressed to assist in the interpretation of materials recovered from the New Office.

Associated with the identification of formation processes is the examination of artifacts collected from previously excavated and/or disturbed contexts. Comparison of artifacts

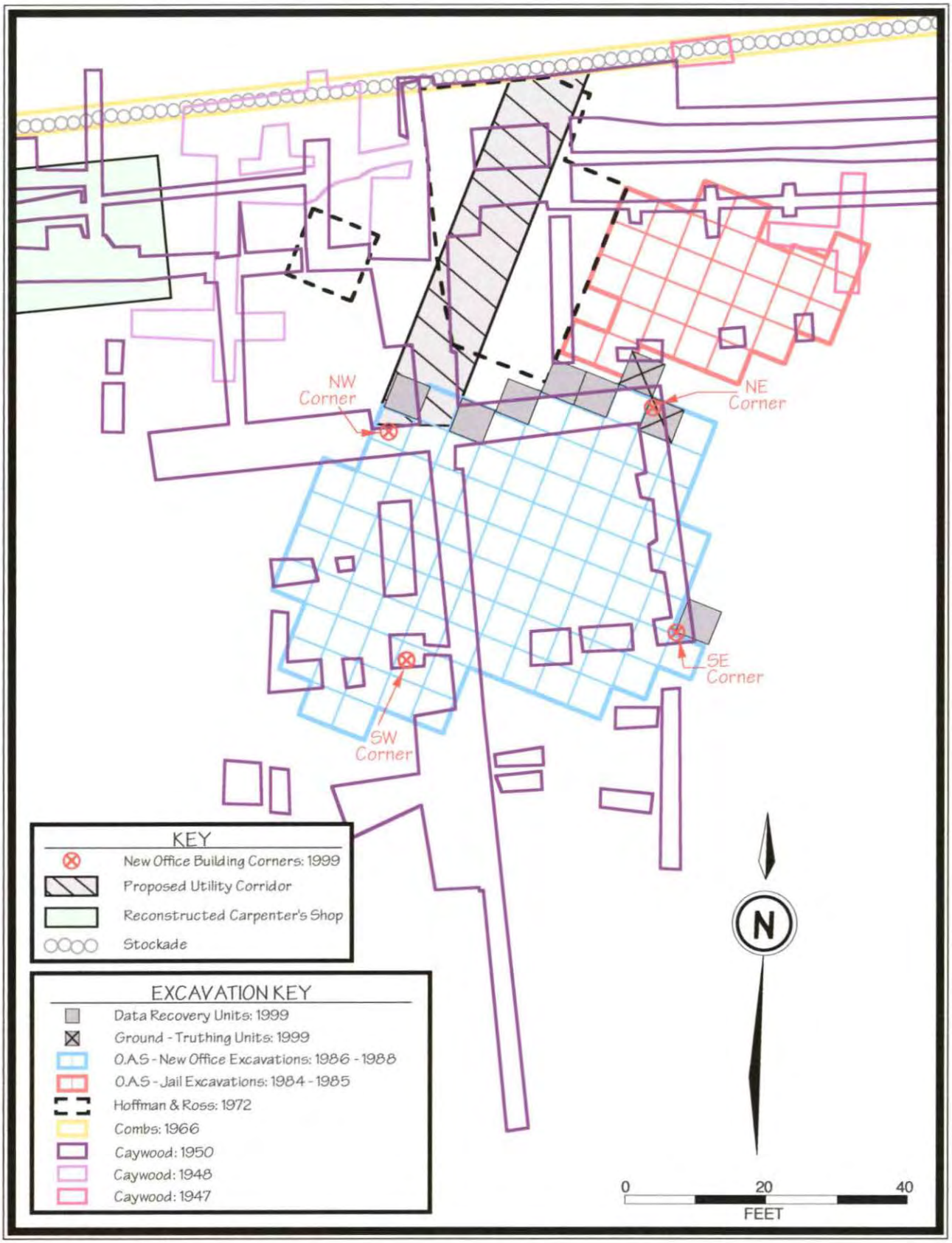

Figure 1. New Office Investigation, showing the location of past and current archaeological excavations.

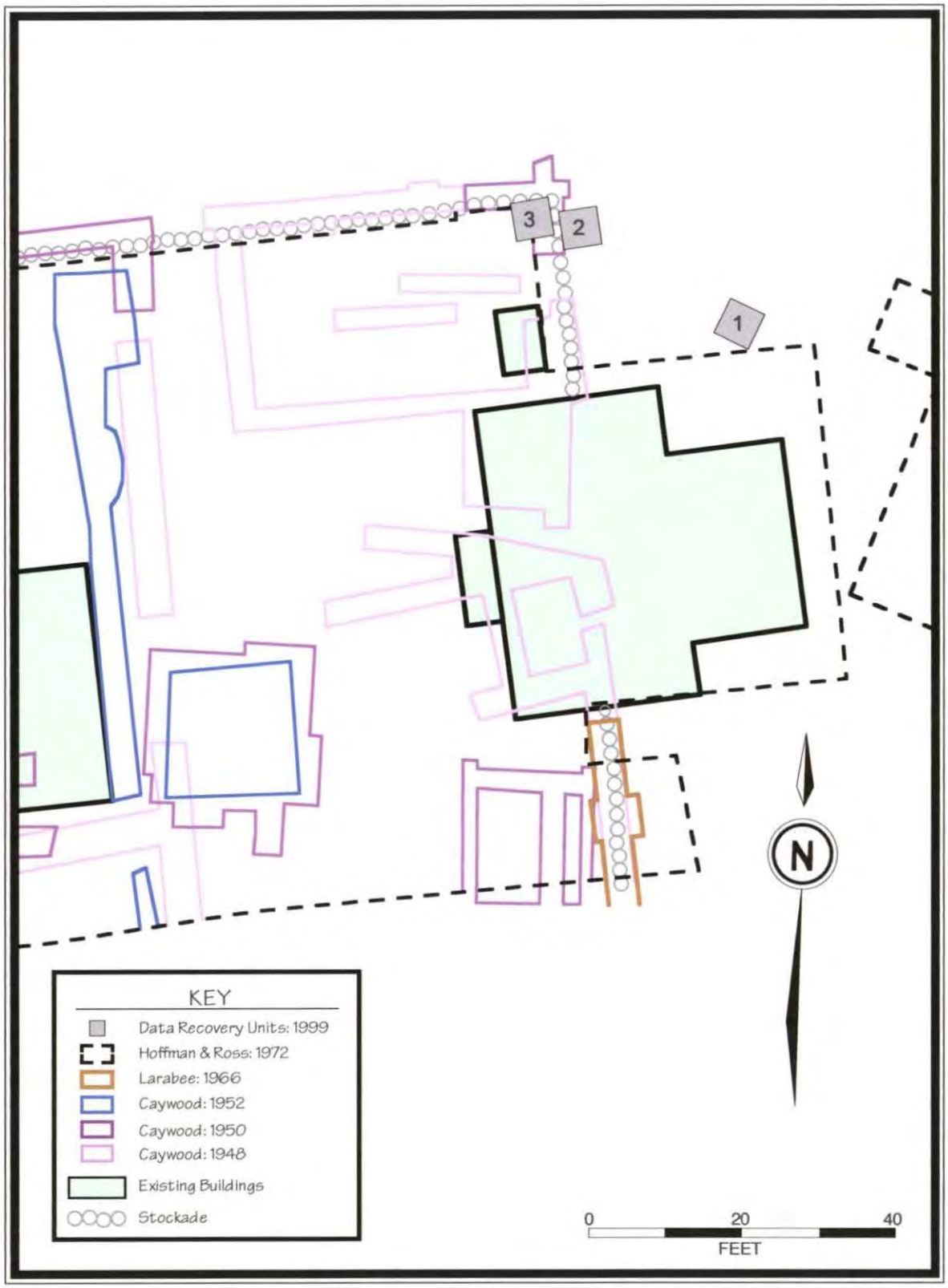

Figure 2. Waterline and Stockade Investigations, showing the location of past and current archaeological excavations.

recovered from backfilled excavation units provides a measure of archaeological recovery bias associated with past excavation techniques. Comparison of the current recovery of artifacts, which used nested ¼- and ⅛-inch mesh hardware cloth, with the recovery of artifacts from the 1986 New Office excavations, which used ⅜-inch mesh, informs on the types of materials lost and the quality of data recovered using the larger mesh.

Finally, an important goal of the excavations was to ground-verify the previous archaeological excavations. This was crucial for determining the precise location of the New Office site and to begin to register past excavation units to standard geographic coordinate systems, such as the Washington State Plane and Universal Transmercator (UTM) systems. This was necessary because over the past 50 years there have been various techniques used to place excavations on a variety of grids and with varying levels of success. Fixing the excavations precisely in geographic space and assessing the error associated with past work will improve the future reconstruction and management of the site.

PREVIOUS INVESTIGATIONS

Since 1947, when Louis Caywood initiated excavations to relocate Fort Vancouver, the site has been investigated by numerous archaeologists. The 5 x 5-ft. units of the New Office and Stockade Investigations were placed within or abutted areas that had been previously excavated by a number of researchers. The 5 x 5-ft. unit of the Waterline Investigation was located near previous archaeological excavations, but had never been excavated by archaeologists.

NEW OFFICE

The New Office was constructed in 1845 over the remains of the 1829-1836/37 stockade. While intended as an office for the Hudson's Bay Company, between late 1845 and May 1847 it served as the residence of Commander Thomas Baillie of H.M.S. *Modeste*. After May 1847 it was used as an office where the accounts of the company were maintained. The building may have been used by the U.S. Army after 1860, but appears to have been demolished and/or burnt by 1866. Hussey (1976) and Hibbs (1987) provide additional background information on the history of the New Office. After its demolition, the area was used by the army throughout the late 19th and early 20th centuries. Of particular note, an immense Spruce mill was constructed on the site during World War I, including a number of railroad spurs and a large slash burner. The ballast for the railroad and other fill placed on the site at that time largely protected the New Office deposits from later disturbance.

Excluding the current project, portions of the New Office have been studied by Caywood (1955) and by the Oregon Archaeological Society (OAS), an avocational group based in Portland, Oregon, under the professional direction of Charles Hibbs (Hibbs 1987; Thomas 1995). Other excavations near the New Office consist of excavations at the Belfry by Hoffman and Ross (1973) and at the Jail by OAS (Steele and Cummings 1996). Figure 1 shows the location of excavations in t9he New Office area. Archaeological explorations by Combes in 1966 are shown along the north wall of the stockade and the reconstructed Carpenter's shop is shown to the northwest of the New Office excavations. With the exception of Caywood's work,

excavations associated with the Carpenter's shop (Brauner 1995; Thomas and Freidenberg 1997) are not shown in Figure 1.

Caywood (1955:13-14) excavated a number of trenches across the New Office area in 1950, discovering 14 footings associated with the structure. These were described as large, well-preserved wooden slabs. Based on measurements from the centers of the corner footings, Caywood suggested that the structure measured 31 by 37.5 ft. Historical records indicate that the exterior measurements of the building were 32 by 38 ft., closely conforming to Caywood's reconstruction. Caywood does not report artifacts from these excavations, and he apparently did not screen his materials and was very selective in the objects he retained.

In 1972, the National Park Service (NPS) conducted excavations directly to the north of the New Office building to discover and excavate the remains of the Belfry. These excavations are reported in Hoffman and Ross (1973). The Belfry excavations, and others conducted by Hoffman and Ross in the 1970s, employed use of a fixed site datum and a grid of 10 ft. squares set to magnetic north. In 1984 and 1985, the OAS excavated most of the Jail site, also north of the New Office (Steele and Cummings 1996). From 29 excavated 5 x 5-ft. units, set from the NPS site datum and employing the 1972 NPS grid, 50 features were identified and over 19,000 artifacts were collected.

Large portions of the New Office site were excavated in 1986, 1987, and 1988, by the OAS. Field methods for these excavations also entailed use of the NPS grid and excavation of 5 x 5-ft. units. Excavations were conducted in 0.5 ft. levels, with intact 19th century deposits excavated in 0.2 ft. levels. All matrix from the excavations was sieved through ⅜-inch mesh hardware cloth. An interim report by Hibbs (1987) detailed the results of the first field season and Thomas (1996) summarized the results of the three years of excavations. The 1986 excavations excavated 15 5 x 5-ft. units, documenting 15 features and recovering 5,637 artifacts (Hibbs 1987). Thomas (1996) notes a combined 59 features, including 15 foundation footings (14 identified by Caywood and an additional footing found by the OAS), associated with 91 5 x 5-ft. units (some of which were only partially excavated). The total count of artifacts from the three field seasons numbered 24,501. Unfortunately, a detailed excavation map was never compiled for the entire 1986-1988 New Office excavations due to errors made in the grid systems used for the different field seasons (Thomas 1996:5). Based on the combined data, Thomas conducted limited spatial analyses of flat glass and construction materials and inferred architectural details of the New Office.

In 1998, Lester Ross was contracted by NPS to attempt to reconcile discrepancies in the various maps and unit designations identified from the various excavations in the vicinity of the Jail and New Office sites and to define a utility corridor for the proposed New Office reconstruction. This work was detailed in a short report (Ross 1998).

STOCKADE INVESTIGATION

Caywood also conducted excavations in the northeastern portion of the 1841/44 stockade, including excavation of the corner of the stockade in 1948 and 1950 (see Figure 2). Hoffman

and Ross (1972) excavated most of the interior of the 1841/44 stockade as part of the Bakehouse investigations. Of particular note, their excavations identified two privy pits below the cross footings of the 1918 slash burner, the southern of which had previously been excavated by Caywood. The upper portions of the northern privy pit (F158) had been disturbed by the stockade reconstruction of 1966 but the basal dimensions were 7.3 by 3.0 ft. with a depth of 4.95 ft. Like other privy pits at Fort Vancouver, large numbers of complete or nearly complete ceramic vessels were found in stacked positions, and a large amount of glass materials were recovered. A human burial was found at 3.7 ft. below surface directly to the west of the F158 privy along the north wall of the stockade. The area above the burial had been disturbed by previous archaeological work and the use of an air-hammer to remove the concrete from the 1918 burner during reconstruction of the stockade in 1966 had indirectly crushed many of the human remains. Regardless, leather mocassin fragments, "calico china" buttons, a clay pipe spur, and bits of fabric were recovered from inside a small, open wooden coffin measuring 5.9 ft. long by 2.0 ft. wide.

METHODS

The three 1999 investigations at Fort Vancouver National Historic Site required a variety of archaeological techniques. Elements of the original work plan were altered in response to changing field conditions, resulting in the excavation of additional units for the New Office Investigation and fewer units for the Waterline Investigation.

NEW OFFICE INVESTIGATION

According to Ross' (1998:4, Figure 3) cartographic analysis, there was only a single 5 x 5-ft. unit (N30, W280) that had not been excavated in the New Office area. Based on Hibbs' 1987 map of Hudson's Bay Company features (see Ross 1998:Figure 7), Unit N30, W280, was expected to include a portion of a footing for the New Office (Feature 3) and the edge of the 1829-1836/37 east stockade. It was also expected that the excavation unit would abut units that were excavated in the 1970s and 1980s by Hoffman and Ross (1973) and Hibbs (1987), and would include portions of Caywood's excavations.

In the summer of 1999, applied geographer Keith Garnett and the author laid out the four corners of the New Office based on Ross' (1998:4) interpretation of the various excavation maps for the area (see Figure 1). The northeast corner of the office was used as a base for two magnetometer surveys (Kendall McDonald, Z-Too Archaeological Prospection, and Kenneth Karsmizki, Museum of the Rockies) and one ground penetrating radar survey (Larry Conyers, University of Colorado).

On October 18, 1999, the author assisted Keith Garnett to lay out the location of N30, W280, based on Ross' (1998:4) map. A 10 x 10-ft. area corresponding to Ross' positioning of N45, W260, was laid out to expose features identified in the northeast corner of the New Office and the inferred southwest corner of the Hudson's Bay Company jail. Portions of two 5 x 5-ft. units within the 10 x 10-ft. area, N45, W260, and N40, W255, were excavated to ground-truth

the OAS 1985 Jail and OAS 1986/1987 New Office excavations and to ascertain with precision the location of the northeast corner of the New Office (see Figure 1).

The New Office excavations commenced with stripping of the sod and disturbed overburden from the staked-out area of N30, W280, and for an area extending out for about one ft. (30 cm) in every direction. These spoils were placed on tarps. The exposed soil from this 7x7-ft. area was then carefully troweled and scraped to identify disturbance associated with the edges of the previous excavations. It was determined that the eastern, southern, and most of the western walls of N30, W280, had been lined in 1986 with flexible colorless plastic. The northern half of Unit N25, W280, was excavated to expose the 1829-1836/37 stockade trench and the southern portion of Feature 3 (an Hudson's Bay Company footing feature). As this unit was previously excavated in 1986, the sediments excavated from the northern portion of N25, W280, were not sieved and no artifacts were observed. With these excavations, the provenience of Unit N30, W280, was verified, the stockade trench was relocated, and it was discovered that the southern portion of the Feature 8 footing had been removed, leaving a profiling nail and tag and a trace of the feature exposed in the profile of the north wall of N25, W280. Based on this work, the location of N30, W280, was discovered to be 1.5 ft. south (46 cm) and 0.6 ft. (18 cm) west of its staked-out location. It was also discovered that the southern portion of the upper strata of the unit had been mechanically stripped in 1986, but that the northern portion of the upper strata remained intact.

Excavation of Unit N30, W280, proceeded in natural stratigraphic units with the one unit greater than 0.5-ft. (15 cm), Stratum 3, excavated in arbitrary 0.5-ft. (15-cm) levels, and with most of the 19th century cultural deposits in Stratum 4, excavated in 0.2 to 0.3 ft. (6 to 9 cm) levels. Vertical provenience was maintained using a vertical datum tied into the unit through the use of a unit datum, line levels, and string, and tied to the 1970-1975 Fort Vancouver archaeological datum. Excavation of units proceeded to approximately 1.5 ft. (46 cm) below surface to expose the architectural features.

Matrix recovered from the excavations was sieved through nested ¼- and ⅛-inch (6 and 3 mm) mesh hardware cloth. Collected artifacts from the unit were separated by type and material and bagged by excavation level or feature. A bag catalog for the unit was maintained in the field to track the collections. Information from each level was recorded on an Archaeology Consulting level record form, including the site name and number, the unit provenience (coordinates), feature designator, level, strata, excavator, date of excavation, excavation technique, a plan sketch (if appropriate), a detailed soil description, inventory of samples, and descriptive section. To be consistent with previous excavations, measurements were made in feet and tenths of feet. The north wall of the unit was profiled and photographed (using a digital camera and traditional black and white film). The profile was drawn to scale, showing stratigraphic breaks, strata designations, soil constituents, feature boundaries, and evidence for disturbance.

Cultural features were documented photographically, on feature forms, and with a scaled plan and profile sketch. Previously identified features (the 1829-1836/37 stockade and Feature 8, the footing feature) retained their original feature numbers. New features were given an identifier that is unique to the 1999 excavations. As deemed appropriate, wood and soil sediment

samples were collected. Artifacts were collected by stratigraphic unit and these strata were measured vertically and horizontally to facilitate reconstruction of the excavation unit using geographic information systems. Particular attention was given to architectural remains associated with footing features and architectural artifacts. These were carefully noted and mapped *in situ*.

On excavation of N30, W280, it was determined that an intact sediment profile existed in the north wall. This suggested that there was an unintentional baulk of unknown thickness between the 1986 New Office excavations and the 1972 Hoffman and Ross excavations. The next phase of investigations was to excavate portions of N45, W260, and N40, W255, to further ground-truth the earlier excavations and to accurately determine the location of the northeast corner of the structure. As it was believed that these areas had been archaeologically excavated previously, exploration of the units was conducted without screening or maintenance of levels, in the same manner as the northern half of N25, W280 (see above). After stripping the sod, the upper 0.2 ft. of sediments were removed to attempt to identify any plastic lining associated with either unit. Unfortunately, the 1988 OAS excavations in this area had not been lined. A short (about 2.5-ft. long), 1-ft. wide trench was then excavated across the center of the two units to about 1.5 ft. in depth. This exploration identified the northeast corner of N40, W255, at 1.0 ft. (31 cm) south and about 1.2 ft. (37 cm) west of its position based on the stakeout. Examination of the area of a Caywood excavation north of this indicated that except for a portion of Caywood's excavation, apparently all of N45, W260, consisted of previously unexcavated sediments. This indicated that there was a 5-ft. wide baulk between the 1986/1987 excavations and the 1985 excavations for the Jail.

On discovery of the unintentional baulk, and careful reconsideration of Hibbs' 1987 map of Hudson's Bay Company features, Thomas' (1995) synthesis of the excavation data, and cartographic input provided by Keith Garnett, it was determined that the 1986-1988 grid that had been laid out for the New Office area was located over 5 ft. south of where it should have been based on the 1972 site datum. Intact archaeological deposits, including portions of two other New Office footings, were believed to be present in four 5 x 5-ft. units along the north wall at N30, W290; N35, W275; N40, W265; and N40, W270. Further consideration of Thomas' (1995:12) report, suggested that intact archaeological deposits and a substantial portion the southeast corner footing associated with N15, W240, and the entire northwest corner, southwest corner, and west medial footings had not been excavated. Excavation of N15, W240, was conducted to explore the intact archaeological deposits and was intended to recover the intact portion of the southeast corner footing.

Excavation of N15, W240; N30, W290; N35, W275; N40, W265; and N40, W270, were conducted in a manner identical to N30, W280, with the exception that the uppermost NPS and WWI Spruce Mill sediments remaining in the eastern portion of N15, W240, were not screened. In all of the other units, the upper sediments were screened to enhance the understanding of site formation processes.

Excavation of N35, W275, and N40, W265, identified the remaining portions of New Office footing Features 3 and 4. Excavation of N15, W240, revealed that a sand fill had been

Figure 3. Unit N30, W290, showing excavation (M. Darby) and screening techniques (E. Kester). The reconstructed Carpenter's Shop and Bastion are shown in the background.

placed in the 1988 excavations in this portion of the site. The 1988 grid in this area was found to be about 0.8 ft. south of its reported position but on approximately the same northing. It was determined that the portion of the Hudson's Bay Company footing, Feature 48, had already been removed during the 1988 excavations, but that intact archaeological sediments were present across most of the rest of the unit.

All of the exposed architectural and other features, and the edges of previous excavation units for the six 5 x 5-ft. data recovery units were mapped and their characteristics were recorded. Keith Garnett recorded the locations of the current excavations on November 22, 1999, using a total station. This was conducted to verify the true locations of features and excavations with respect to the site-wide geographic information system, and to assess the degree of error associated with prior excavations. The Washington State Plane coordinates and elevations for the units are provided in Appendix 1. The locations of the 1999 excavations and the new field-verified interpretations of the OAS and Hoffman and Ross excavations for the New Office area

are shown in Figure 1. Of these, the current excavations have field verified Caywood's 1950 and the 1986 and 1988 OAS New Office excavations, including the locations of the northeast and southeast corner footings of the New Office structure. The 1987 OAS New Office excavations, the 1984-85 OAS Jail excavations, and the 1972 Hoffman and Ross excavations have not been field verified.

It should be noted that the New Office units that were excavated in 1999 were given identifiers to maintain consistency with the grid designations used by OAS in 1986 and 1988. The actual grid designations with respect to the site datum and 1972 grid, however, are approximately 5 ft. south.

WATER LINE INVESTIGATION

Archaeology Consulting excavated one 5 x 5-ft. unit to mitigate the effects of a proposed waterline. The 5 x 5-ft. unit (Unit 1) was excavated at the location of the existing water box east of the stockade and immediately north of the Bakehouse. Excavations were conducted in the same manner as for Unit N30, W280 (see above). On November 22, 1999, Keith Garnett mapped the 5 x 5-ft. unit with a total station and tied it to the site's archaeological datum. The walls around the water meter will be monitored as the meter box is removed and replaced. It was originally planned to excavate a 5 x 5-ft. unit at the location of the waterline splice. On identification of the existing waterline trenches, this was deemed unnecessary. The waterline trench excavation will be monitored to ensure that intact and significant historical deposits are not disturbed.

STOCKADE INVESTIGATION

Archaeology Consulting excavated two units to determine the extent of the concrete footing that reinforces the stockade pickets. One 5 x 5-ft. unit was excavated outside the northeast corner of the stockade, offset two feet south of the kingpost, with the west wall flush with the edge of the stockade (Unit 2). A second 5 x 5-ft. unit was excavated on the inside northeast corner of the stockade, with the north wall of the unit beginning from the edge of the concrete footing and the east wall flush with the stockade. While these areas had been previously disturbed by trenching and archaeological excavations, the sediments were excavated and sieved in the same manner as N30, W280. Numerous artifacts were recovered, providing data with which to explore archaeological and other formation processes. Again, Keith Garnett mapped the units on November 22, 1999, with a total station and tied them to the site's archaeological datum.

For the entire project, a complete photographic record was maintained using black and white film and digital images. A daily log was maintained during the three investigations to identify crew assignments, conditions, and to track the progress of the excavations. As needed, a crew member greeted visitors to the excavation site, explained the archaeology project, and answered questions.

LABORATORY PROCESSING AND ANALYSIS

All artifact preparation, processing and analysis was performed at Fort Vancouver National Historic Site in the park's archaeological collection facility (Fur Store). All recovered artifacts were cleaned by either washing or dry-brushing as appropriate. Artifacts from each unit of provenience were assigned a unique field lot number. Bags of ceramics, glass, ferrous metal, other metal, faunal remains, stone artifacts, and diagnostic artifacts, from each lot were assigned a unique field specimen number. A computer-based database for all recovered materials was maintained to track the materials through the various analysis steps.

After cleaning, artifacts were analyzed by material type, manufacturing and technological characteristics, and formation process traces. Previously constructed typologies for Fort Vancouver were employed to identify the collected artifacts (e.g., Ross [1976]; Thomas [1995]).

RESULTS

Approximately 275 person-days were employed in the excavations and 275 ft^2 (25.5 m^2) of ground were exposed. Including only those units where sediments were sieved, 15.6 yards yards (11.93 m^3) were excavated. The volume of sediments hand-excavated from the units is shown in Table 1. These volume figures do not include excavations to expose the stratigraphic sequence in N25, W280, or the units excavated to verify the northeast corner of the New Office in N45, W260, and N40, W255.

STRATIGRAPHY

The excavations yielded distinctive stratigraphic profiles. For each investigation, strata were numbered from top to bottom and strata designations from one investigation area to another do not necessarily match. Further, the designation of the sod layer as Stratum 1 for most of the 1999 excavations and the absence of the 1894 flood deposit from all but one of the excavation units, resulted in differences in strata designations from previous excavations conducted at the New Office site. Strata designations for the current excavations, and their comparison with past designations, are discussed below.

New Office

The New Office area contained five distinct strata, which have been defined Stratum 1 through Stratum 5. The upper three strata (Strata 1-3) contain abrupt boundaries associated with historical and modern-period use of the site, including activities conducted by the National Park Service and the U.S. Army. Stratum 4 contains the original surfaces used by prehistoric Native Americans, the personnel of Hudson's Bay Company, and the U.S. Army in the 19th century. The characteristics of these sediments are as follows. Profiles are provided in Figures 4 and 5.

Stratum 1 (0-.1 ft. below surface), the sod layer, was a very dark grayish-brown [10YR3/2 (dry), 10YR2/2 (moist)] sandy loam with a weak, very fine to fine, crumb structure, soft, very friable, non-sticky, with many very fine to micro-roots and an abrupt, smooth lower

boundary. No artifacts were recovered from this stratum. Stratum 1 was stripped from portions surrounding N30, W280, and N15, W240, to facilitate identification of the OAS excavation units and is not shown in the profiles.

TABLE 1. VOLUME OF SEDIMENTS EXCAVATED

UNIT	VOLUME (ft.^{3})	VOLUME (m^3)
N15, W240†	46.80	1.32
N30, W280	41.34	1.17
N30, W290	58.22	1.65
N35, W275	49.24	1.39
N40, W265	51.55	1.46
N40, W270	45.30	1.28
UNIT 1‡	19.49	0.55
UNIT 2	55.81	1.60
UNIT 3	53.44	1.51
TOTAL	421.19	11.93

Notes: † Includes 33.54 ft.^{2} (0.95 m^3) of NPS and Stratum 3 (Spruce Mill-era) sediments that were not sieved.

‡ Low volume is due to the presence of the water box.

Stratum 2 (.1-.5 ft. below surface) was a yellowish-brown [10YR5/4 (dry), 10YR3/3 (moist)] loamy sand with a weak to moderate, fine subangular blocky structure, soft, friable, non-sticky, with common very fine to micro-roots, and an abrupt, smooth, lower boundary. This stratum represents fill materials introduced by the National Park Service, probably in the 1960s or early 1970s. In photographs from the 1986 excavations, it appears that Stratum 2 in the northern portion of the New Office excavations (excluding N15, W240) was a walkway that ran east-west across the excavation area and ran by the wayside exhibit that was present at N30, W280. Very few artifacts were recovered from Stratum 2, and most of these were of modern age. Portions of Stratum 2 pinched out in N40, W270, either due to being on the edge of the walkway or possibly through removal during the 1970s excavations for the Belfry (Hoffman and Ross 1973). The 1986 OAS New Office excavations also removed large amounts of Stratum 2 in N30, W280.

In N30, W290, the upper portion of Stratum 2 (defined as Stratum 2a -- see Figure 5) was a very dark brown [10YR2/2 (dry and moist)] gravelly sandy loam, with a moderate, fine subangular blocky structure, soft, friable, non-sticky, and non-plastic. Below this, a more narrow and discontinuous yellowish-brown Stratum 2b, was identified. It seems clear that Stratum 2 in this area has been disturbed, probably during construction activities associated with the

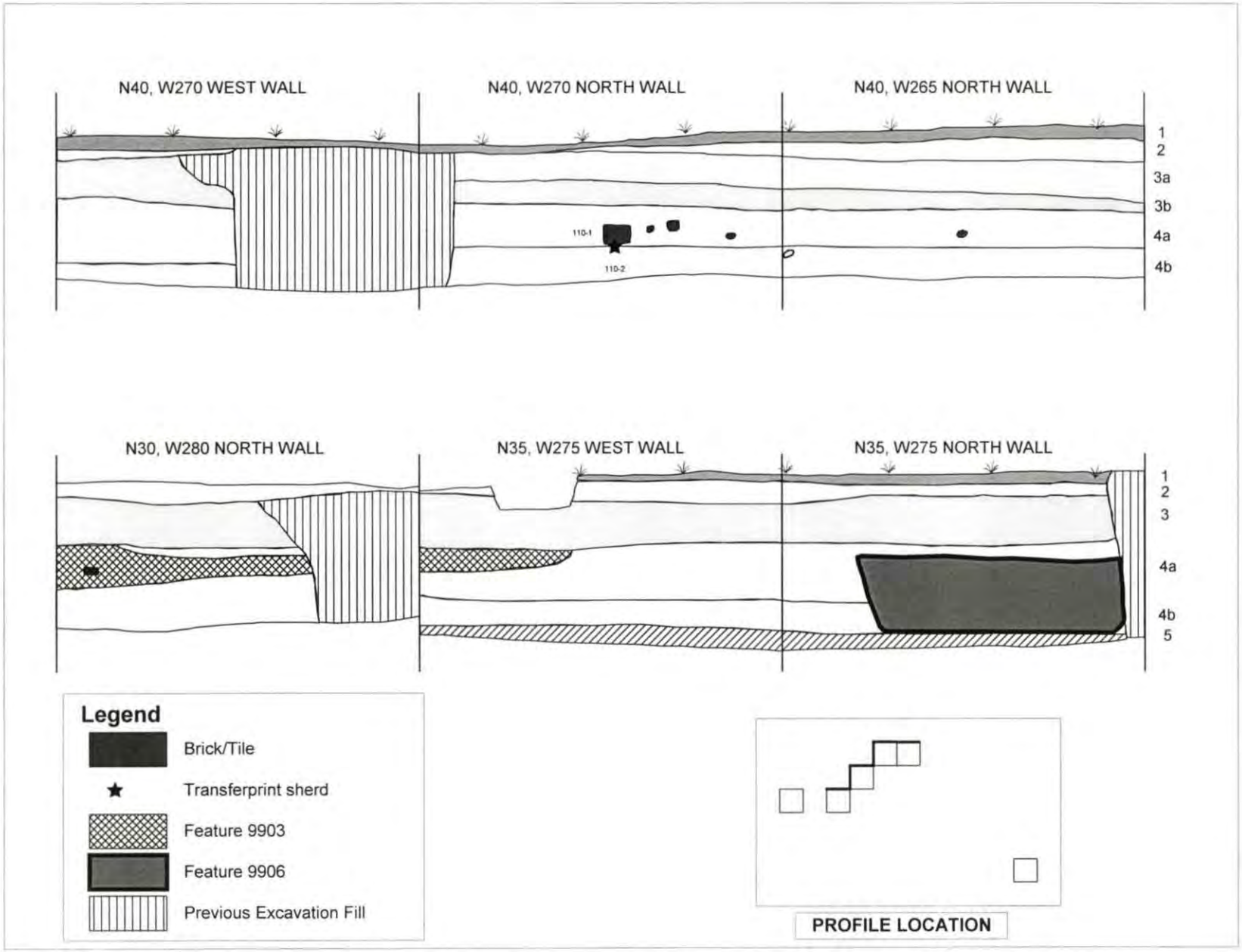

Figure 4. Profiles for N30, W280; N35, W275; and N40, W265-270.

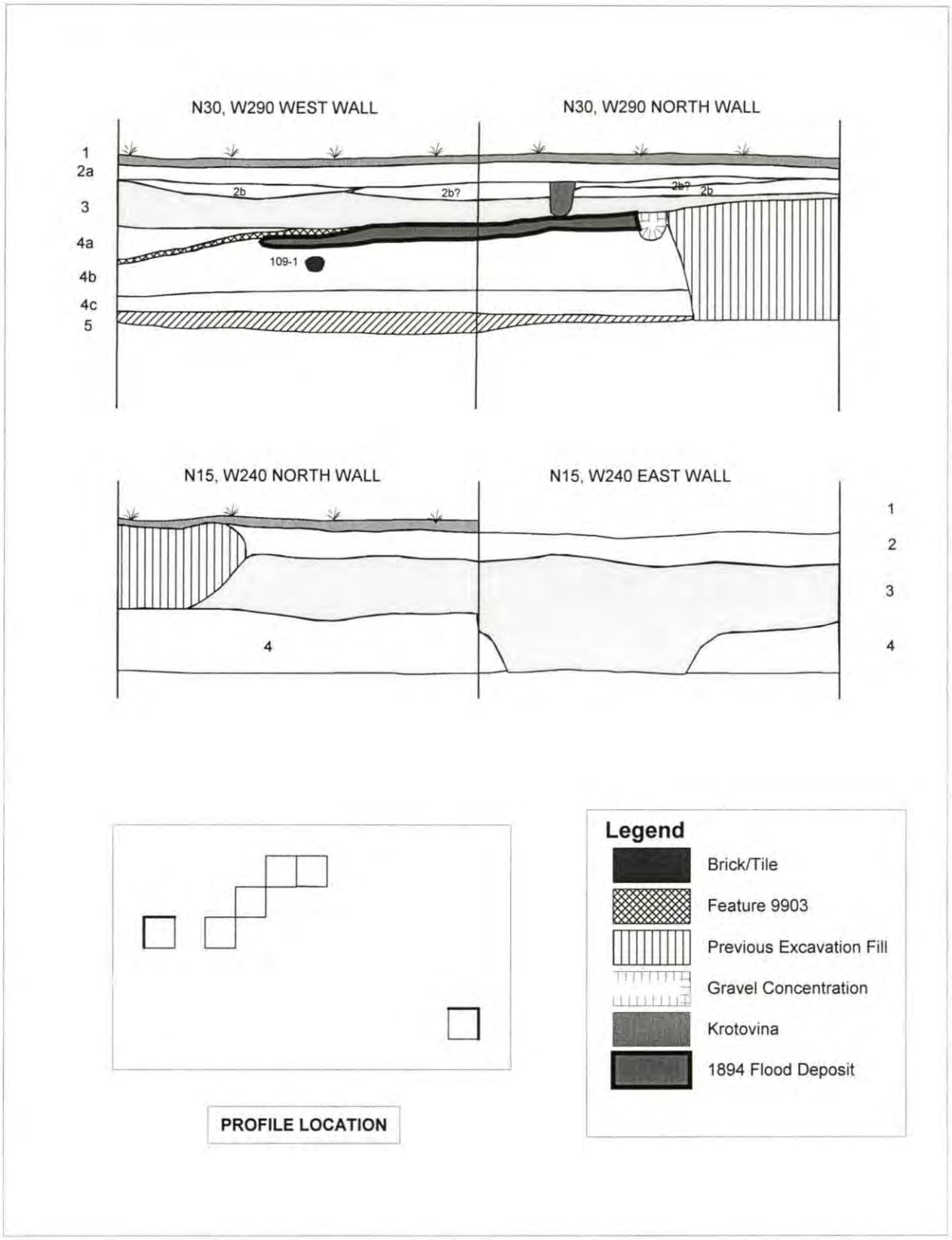

Figure 5. Profiles for N30, W290, and N15, W240.

carpenter's shop. In N15, W240, the Stratum 2 sediments were similar in color and texture to the Stratum 2a sediments of N30, W290. This area does not appear to contain the yellowish-brown sediments found along the northern edge of the New Office. The 1999 Strata 1 and 2 conform to OAS Stratum 1 from the 1986-88 excavations.

Stratum 3 (.5-1.0 ft. below surface) was a dark grayish-brown [10YR4/2 (dry), 10YR3/2 (moist)] very gravelly silt loam, with a weak, fine to very fine crumb structure, soft, friable, non-sticky, with common very fine to micro-roots, and an abrupt, smooth lower boundary. This stratum is interpreted as ballast and other 20th century U.S. Army fill associated with the WW I-era Spruce Mill railroad spur that ran directly north of the location of the New Office site. In the north wall profile for units N40, W265, and N40, W270, a lighter-colored deposit of cobbly Stratum 3 materials was discriminated from a darker-colored deposit of pebbly materials. These have been described as Stratum 3a and 3b. Each are interpreted as a different, but closely related fill episode associated with the construction and use of the Spruce Mill.

Stratum 3 was disturbed in places by Caywood's excavations (Feature 2) and, unfortunately, the backfill of these excavations within Stratum 3 looked very similar to that of Stratum 3 and was difficult to discriminate. There were relatively few artifacts in Stratum 3 and the majority appear to be associated with this backfill. Stratum 3 conforms to the 1986-1988 OAS Stratum 2.

Stratum 4 (1.0-2.2 ft. below surface) was a black [10YR2/1 (dry and moist)] gravelly silt loam, with a moderate, fine to very fine subangular blocky structure, hard to slightly hard, firm, non-sticky, non-plastic, with few to very few micro-roots, and a clear, smooth lower boundary. In its upper portions (generally termed Stratum 4a), it contained a medium to thick, platy structure, very hard and very firm. The lower portions (Stratum 4b and 4c (in N30, W290) were only slightly hard. Stratum 4 appears to be a buried A horizon and contained the intact Hudson's Bay Company and early U.S. Army cultural deposits. In contrast to Stratum 3, the backfill from Caywood's excavations within Stratum 4, for most of the units, contrasted well with the intact deposits, enabling them to be excavated and screened separately. In N15, W240, it is believed that a Caywood excavation intruded into the intact Stratum 4 sediments, but it was not possible to discriminate these materials from the other Stratum 3 sediments in this unit. The upper portions of Stratum 4 contained the majority of artifacts recovered at the site, with almost no artifacts recovered below 1.5 ft. below surface.

Within Stratum 4, the hard-packed sediments associated with Feature 9903 (OAS Feature 15) were identified. In N30, W290, Feature 9903 was observed to cap a narrow layer of largely gravel-free silts associated with the 1894 flood. These flood deposits consisted of a very dark brown [10YR2/2 (dry), 10YR2/1 (moist)] silt loam, with a moderate, fine subangular blocky structure, soft to slightly hard, friable, non-sticky, and non-plastic. In the west wall of N30, W290, Stratum 4 deposits were identified below these flood silts (Stratum 4b) and above Feature 9903 (Stratum 4a), supporting Hibb's hypothesis that the formation of Feature 9903 (OAS Feature 15), posited to be a U.S. Army road bed, resulted in the compaction and homogenization of the flood deposits with the upper and lower portions of Stratum 4 in units farther to the east. OAS defined the flood silts as Stratum 3 and the intact 19th century deposits underlying them as

Stratum 4. For the 1999 New Office excavations, the upper portions of the Stratum 4 deposits appear to reflect a mixed and compacted OAS Stratum 3 and 4. It is believed that the majority of the materials in the 1999 Stratum 4 represent intact 19th century deposits associated with the Hudson's Bay Company with some mixed early-period U.S. Army materials in the uppermost layers.

Stratum 5 (1.2-1.4 ft. below surface) was a very dark brown [10YR2/2 (dry and moist)] gravelly silt loam, with a moderate fine to subangular blocky structure, soft, friable, non-sticky, and non-plastic. This stratum is interpreted as pre-Hudson's Bay Company deposits and appears to represent a B-horizon. It was generally exposed in the floor and lowest portion of the unit profiles and was not recognized as a distinct stratum during the excavation until profiling. This stratum contained few artifacts, undoubtedly intrusive materials from the upper cultural layers. This stratum was not identified by the OAS excavators.

Portions of Caywood's trenches are shown in the profiles for N40, W270; N30, W280; and N30, W290. It is possible that the disturbance in the very north edge of N40, W270 is also associated with the southern extent of the 1972 Hoffman and Ross excavation for the Belfry. As noted above, it is likely that another Caywood trench cut into the intact Stratum 4 deposits in the east wall of N15, W240. A small pit feature (un-numbered) was noted in the north wall profile for N30, W290, which originated at the base of Stratum 3, cut the inferred 1894 flood deposits, and intruded into Stratum 4 (Figure 5).

Waterline

Unit 1 was excavated over an existing water box to recover archaeological materials to mitigate the proposed waterline project. Disturbance associated with the 1918 slash burner and the modern construction of the water box had disturbed most of the sediments associated with Unit 1. The profile observed in the north wall provided a means of describing the more intact strata associated with this investigation.

Stratum 1 (0-0.1 ft. below surface) was the sod layer whose characteristics are identical to that described for the New Office Investigation.

Stratum 2 (0.1-0.3 ft. below surface) was a dark brown [10YR3/3 (moist and dry)] sandy loam with a moderate, fine to very fine subangular blocky structure, slightly hard, firm, non-sticky, non-plastic, with common micro- to very fine roots. It had an abrupt, smooth, lower boundary. This stratum appears to conform to materials deposited by the NPS and the U.S. Army in the 20th century.

Stratum 3a (0.3-0.8 ft. below surface) was a very dark grayish-brown [10YR3/2 (dry), 10YR2/1 (moist)] gravelly sandy loam with a moderate, very fine to fine crumb structure, soft, very friable, non-plastic, with common micro- to very fine roots. It had a clear, smooth lower boundary. This stratum was associated with sediments on top of Feature 9901, the concrete footing for the 1918 slash burner, and appears to represent the remains of the demolition of that

structure. It was not observed as a distinct stratum from Stratum 3b until the profile was examined after excavation was completed.

Stratum 3b (0.8-2.2 ft. below surface) was a black [10YR2/1 (dry and moist)] gravelly silt loam with a moderate, very fine to fine subangular blocky structure, soft, friable, non-sticky, non-plastic, with few very fine to micro-roots. The lower boundary was clear and smooth. This stratum also appeared to contain 20th century materials, probably associated with the excavation of the hole for the existing water box.

Stratum 4 (2.2-2.5 ft. below surface) was a dark brown [10YR3/3 (dry), 10YR3/2 (moist)] gravelly silt loam, with a weak, very fine subangular blocky structure, very friable, slightly sticky, and non-plastic. The lower boundary was not encountered. This stratum appears to be the local expression of Stratum 5 from the New Office Investigation and represents sediments that were laid down prior to the historic period.

Stockade

Both units of the Stockade Investigation contained very different profiles. As all of the materials from Unit 3 represented disturbed backfill from prior excavations, only the materials from Unit 2 were described in detail. The north wall profile for Unit 2 is shown in Figure 6.

Stratum 1 (0-0.2 ft. below surface) was the sod layer. In the western portion of the unit a layer of machine-crushed gravel was present overlying the 1966 concrete footing for the stockade.

Stratum 2 (0.2-3.0 ft. below surface) was trench fill associated with the reconstruction of the 1966 stockade. It consisted of a very dark brown [10YR2/2 (dry and moist)] gravelly silt loam, structureless, soft, friable, non-sticky and non-plastic. Large fragments of asphalt and concrete from the 1966 air-hammering of the footings for the 1918 slash burner were found in this fill. Most of the artifacts recovered from the unit originated in this fill.

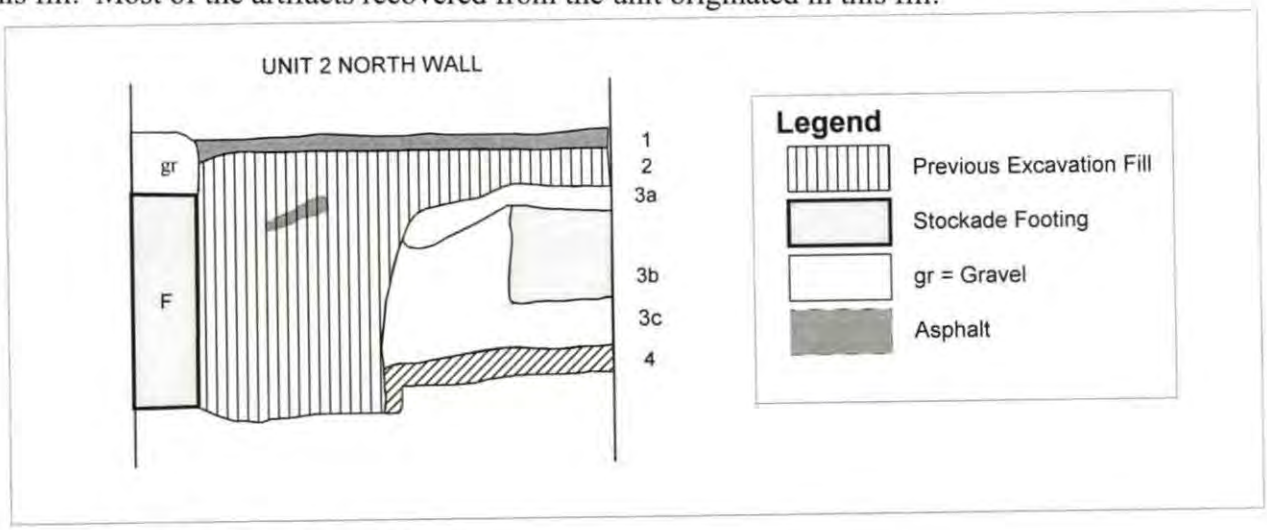

Figure 6. North wall profile of Unit 2.

Stratum 3 (0.5-2.4 ft. below surface) were sediments associated with the construction, use, and demolition of the 1918 slash burner. This stratum was only observed in the eastern half of the unit between the remnants of the concrete foundation for the burner (Feature 9901) and the trench excavated for the 1966 stockade. Stratum 3a was a 0.2-ft. thick layer observed in the north wall of Unit 2 consisting of a yellowish-brown [10YR5/4 (dry), 10YR4/3 (moist)] coarse gravelly sand, with a moderate, fine to medium crumb structure, soft, very friable, non-sticky, and non-plastic. It contained an abrupt, smooth lower boundary. Stratum 3b and 3c were essentially the same except that 3c was very hard and firm, while 3b was only slightly hard and friable. Otherwise, Stratum 3b and 3c consisted of a black [10YR2/1 (dry and moist)] gravelly silt loam, with a moderate, very fine to fine subangular blocky structure, non-sticky, non-plastic.

Stratum 4 (2.4-3.0 ft. below surface) was only observed in the eastern half of the unit. It underlay the foundation for the slash burner and is essentially identical to Stratum 4 in Unit 1.

The entire profile of Unit 3 represented disturbed sediments associated with previous excavations and reconstructions. Strata 1-3 (0-1.2 ft. below surface), were sediments associated with the reconstruction of the privy structure. Below 1.2 ft., a brown to dark brown, very gravelly sandy loam with small cobble-sized chunks of concrete was noted in a narrow band along the edges of the concrete footing for the 1966 palisade. This is inferred to represent the fill from the palisade reconstruction. Elsewhere, a dark brown, very gravelly sandy loam was encountered. A portion of the concrete footing for the 1918 slash burner (Feature 9901) was identified in the southwest corner of the unit.

FEATURES

A total of 9 features were recorded. For the New Office Investigation, feature numbers defined by OAS were used when appropriate. These include Caywood's excavations (Feature 2) and Hudson's Bay Company footing features (Features 3, 4, and 8). Figure 7 shows features associated with the New Office site placed in reference to the 1986 OAS excavation plan. In some cases, an interpretation of the 1986 data was necessary to match lines between the two excavations. The discrepancies observed between OAS unit boundaries represented by fill deposits along the east wall of N35, W275, and N40, W265, are shown as Feature 9904 in Figure 7. In general, however, the results of the two sets of excavations, especially in terms of feature locations, matched quite well. Plan views for Units 2 and 3 are shown in Figure 8.

NPS Features

Two features were identified as the backfilled excavation units from digs sponsored by the National Park Service. These were generally noted on plan maps and profiles. Materials from the Caywood excavations (Feature 2) were screened, while materials from the OAS excavations (Feature 9904) were not.

Feature 2 was defined by OAS as the backfilled Caywood excavations (Hibbs 1987:14). About 18.5 ft.^{3} (.5 m^3) of the deposits excavated in 1999 were identified as Feature 2. This

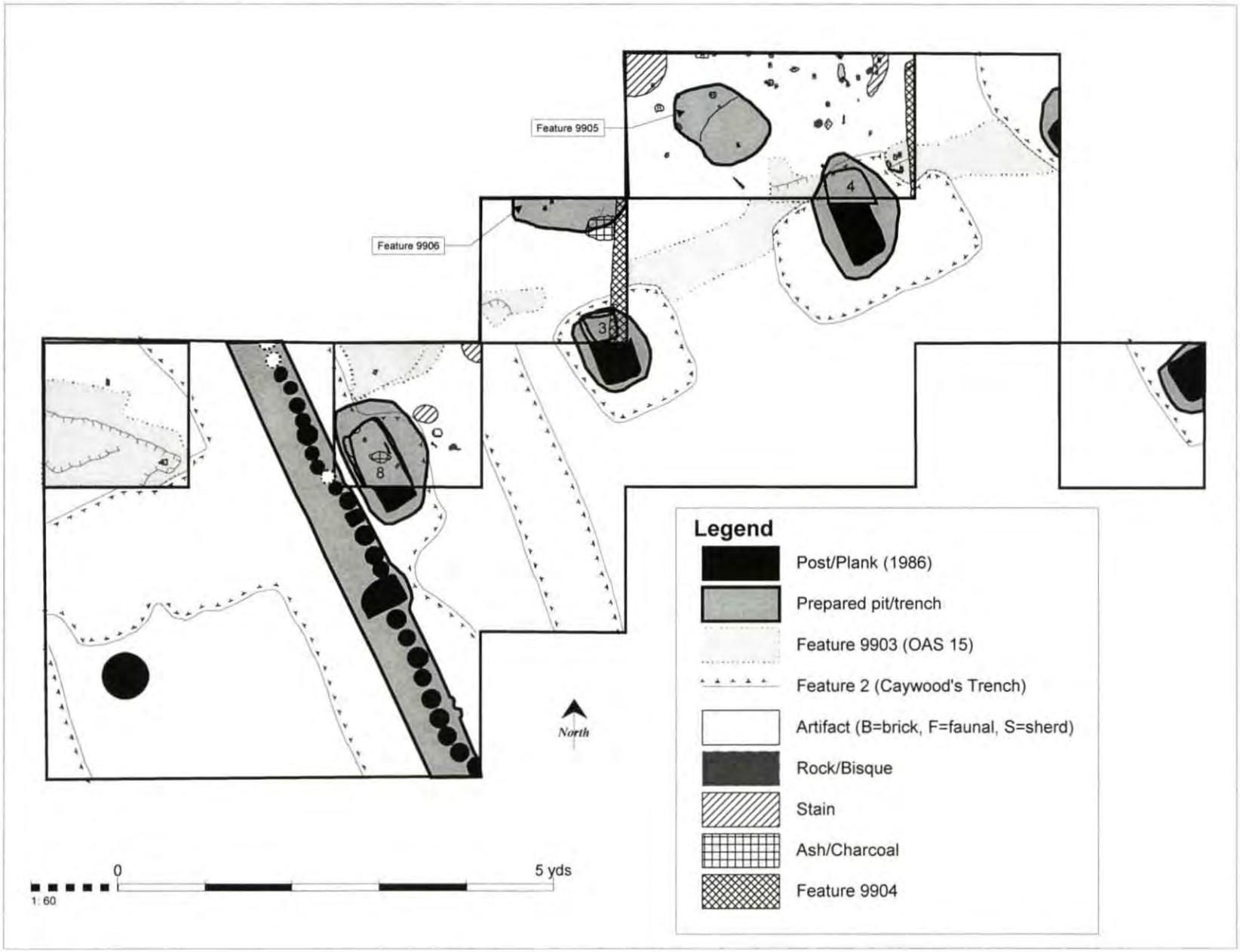

Figure 7. Plan view of the 1999 excavations with respect to the 1986 results.

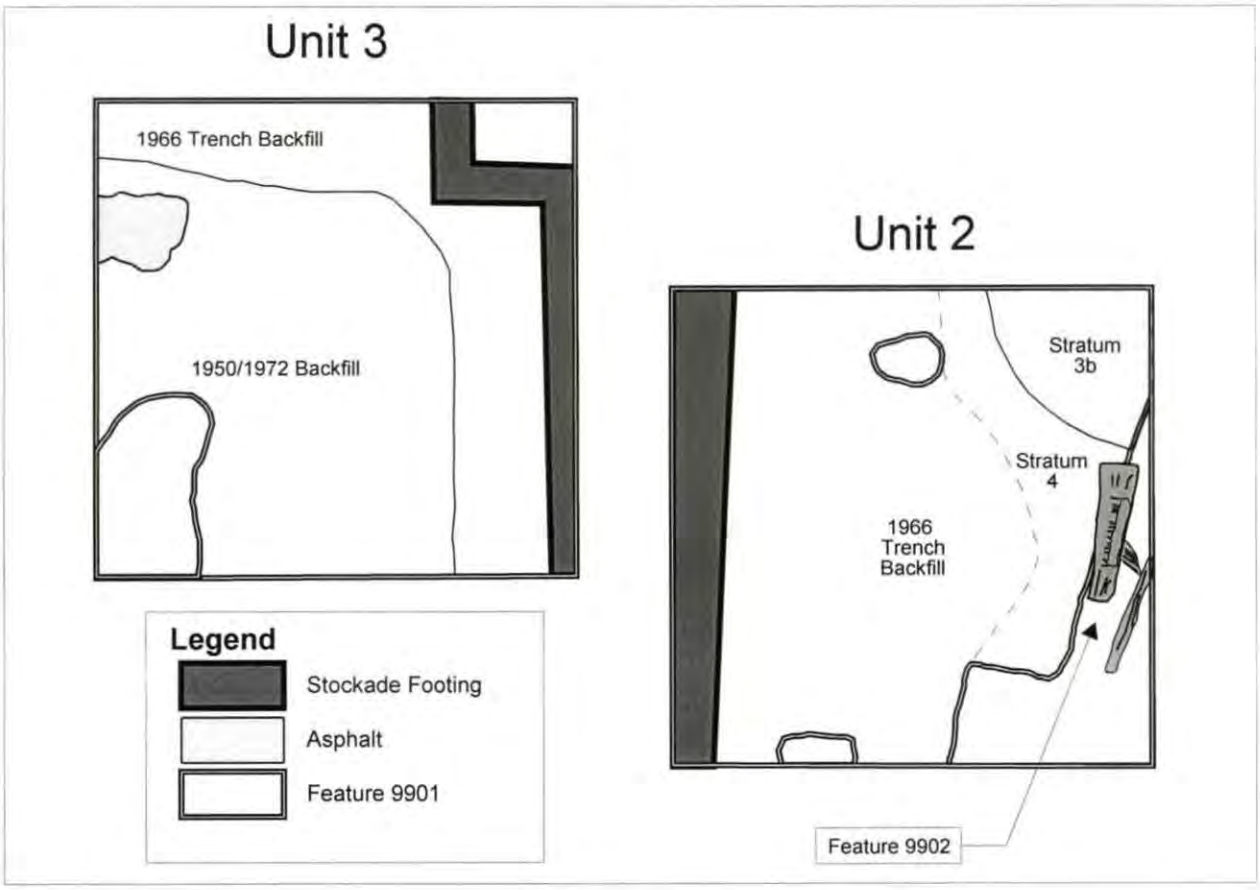

Figure 8. Plan view of Units 2 and 3 of the Stockade Investigation.

represents a minimum amount, as some of the Caywood trenches and backfill in Stratum 3 could not be distinguished from the undisturbed Stratum 3 sediments during excavation. While Hibbs suggests that about 49% of the deposits excavated during the 1986 OAS dig were disturbed by Feature 2, only about 10% of the sediments excavated in 1999, below Stratum 3, were disturbed (Table 2). This is because most of the 1999 excavation units extended north of the trenches excavated by Caywood and because Caywood's excavations at these locations only cut into the 19th century deposits at the locations of the footing features. This left a large sample of intact 19th century deposits associated with the current excavations. The Caywood trench reported by Hibbs in N30, W275, was not observed to extend into N40, W280 or N35, W275. The removal of materials associated with the U.S. Army road (Feature 9903), in these units, however, suggest that a portion of the northeast corner of N30, W280, and the southwest corner of N35, W275, may have been disturbed. The disturbance in these units is believed to be more limited in area than what would be extrapolated from the OAS results.

Feature 9904 was defined as the backfilled OAS excavations from 1986-1988. For most of the 1986 units along the north wall of the New Office, those excavation walls containing intact profiles had been lined with clear flexible plastic and the units backfilled, presumably with the

same materials that had been excavated and sieved. As noted above, the 1988 excavations were not lined, while the southern portions were backfilled with a homogeneous coarse sand.

TABLE 2. VOLUME OF FEATURE 2 (CAYWOOD'S BACKFILLED TRENCHES) BY UNIT

UNIT	Volume of Feature 2 (ft.^{3})			Volume of Intact Stratum 4 (ft.^{3})	Sediments below Stratum 3 disturbed by Feature 2 (%)
	Total	Stratum 3	Stratum 4		
N15, W240	4.4		4.4	8.8	33.3%
N30, W280	2.8		2.8	20.5	12.0%
N30, W290	3.0	0.5	2.5	28.9	8.0%
N35, W275	2.1		2.1	26.6	7.3%
N40, W265	6.2	3.9	2.3	19.9	10.3%
N40, W270	0.0		0.0	20.6	0.0%
TOTAL	18.5	4.4	14.1	125.4	10.1%

U.S. Army Features

Feature 9901 was the concrete footing for the 1918 slash burner. It was identified in the northern and western portions of Unit 1, the southeast portion of Unit 2, and the southwest portion of Unit 3. In Unit 1, it consisted of a poured concrete slab, finished on the top, with the remaining portion in the western portion of the unit about 1 ft. in diameter at the top and expanding to 1.4 ft. northeast-southwest by 1.2 ft. northwest-southeast at the base of excavations. In the northern portion of the unit it was only about 0.5 ft. north-south by 1.0 ft. east-west. It extended into the north, south, and west walls. The feature was encountered at about 0.7 ft. below surface and it extended to the base of excavations in the southwest corner of Unit 1, at about 1.5 ft. below surface, and to about 2.0 ft. below surface in the north. The concrete foundation had been partly demolished to make room for the water box. Large concrete fragments associated with the feature were noted southeast of the water box and northeast of the intact portion of the feature.

In Unit 2, Feature 9901 was encountered at 1.0 ft. below datum and it extended to 2.7 ft. The slab was roughly "L" shaped, 3.5 ft. north-south by 1.0 ft. east-west and it extended into the east and south walls (see Figure 8). The western portion of the feature had been jack-hammered to create the trench for the 1966 palisade footing, leaving large concrete chunks throughout Stratum 2. Feature 9902, discussed below, was situated on top of Feature 9901 in this unit.

In Unit 3, Feature 9901 was encountered at 1.25 ft. below surface and it extended to the base of excavation at 2.7 ft. The feature was located in the southeast corner of the unit (see Figure 8). Near the top of the feature, it measured 1.3 ft. north-south by 1.0 ft. east-west and it expanded to about 1.9 ft. north-south by 1.2 ft. east-west by the base of excavation. The slab had been jack-hammered and large pieces of concrete were found throughout the fill of the unit.

Feature 9902 was a concentration of milled wood on the top of Feature 9901 in Unit 2 (see Figure 8). The top wood piece was a 2 x 8 in. (true-dimension) board, 1.5 ft. in length placed on-end with a ½-in. fragment of plywood. These two boards rested on a 1.45 ft. long board, between 0.2 and 0.3 ft. in thickness. A third board was 1.1 ft. in length and measured 1 ¾ in. wide by ½ in. thick. These boards appear to be demolition debris associated with the 1918 slash burner.

Feature 9903 is a compacted surface running along the north wall of the New Office that appears to correspond to OAS Feature 15 (see Figure 7). Hibbs (1997:15-16) described Feature 15 as:

> "*a very compacted area along the northeast edge of the site . . . figured to have been an army road. The 1894 flood silt was truncated (or possibly mixed with earlier sediments) and upper Stratum 4 silts were thinly laminated with silt, charcoal, and pea gravel lenses. Highly fragmented H.B.C.-period artifacts were intermixed and an early 20th century sheet metal machine part (truck or auto?) was recovered. Despite the mixture, the H.B.C. artifacts appear to have been simply fragmented in place rather than mixed or redeposited from another location.*"

This description conforms closely to the compacted surface identified as Feature 9903 in 1999. In general, a smooth, compacted surface was noted at the top of the feature, often associated with one or more lenses of coarse yellowish-brown sand. While the surface was generally level, in places it contained dips and east-west running trenches, suggestive of a tire track. Beneath this surface, feature sediments were very hard and compact. As discussed above, the north and west wall profiles for N30, W290, show the truncation of the 1894 flood silts and the artifact analyses show that the uppermost level of Stratum 4 generally contains lower densities of artifacts and greater evidence of pre-WW I mixing than lower units. Much of the fragmentation of artifacts in these units may be due to WW I-era road disturbance.

Hudson's Bay Company Features

Portions of three footings from the New Office were excavated. Two refuse features along the north wall were also identified.

Feature 3 was defined by OAS as a medial footing of the New Office. The remaining portion in N35, W275, was about 1.0 ft. long north-south (perpendicular to the stockade) by 1.0 ft. wide (Figures 7 and 9). Most of the feature had been previously removed by OAS to the east and south. The feature was encountered at about 1.5 ft. below datum and extended to about 1.7 ft. with the prepared pit extending to about 1.95 ft. Compared with the other partial footing features excavated in 1999, the remaining portion of Feature 3 was very well preserved. It appeared to be a cedar plank with some charring evident on the southern end. Most of the plank within the unit was intact, with the remaining portion weighing 1.33 kg. The post mold dipped slightly to the east and some fragments of gray clay suggest that the pit may have been lined. The 0.6 $ft.^3$ of sediments excavated from Feature 3 yielded only two artifacts, consisting of a small

Figure 9. Feature 3 exposed. The scale is 1 ft.

fragment of undecorated white earthenware and a fragment of green glass. In addition to the large wooden plank fragment, 59 other small wood fragments were recovered from the plank mold and prepared pit, weighing a total of 6 g.

Feature 4 was also defined by OAS as a footing feature. The remaining portion in N40, W265 was about 1.2 ft. long north-south (perpendicular to the stockade) by about 1.5 ft. wide (see Figures 7 and 10). A large portion of the feature had been excavated by OAS to the south. The feature was encountered at about 1.75 ft. below datum and extended to about 2.0 ft. with the prepared pit extending to about 2.3 ft. The remaining portion of the pit was about 1.8 ft. north-south by 1.8 ft. east-west. The plank had apparently burned at relatively high temperature as the feature was only recognizable as a mold filled with charcoal, bisque, charred wood, ash, nails, glass, and other artifacts. Only 24 fragments of charcoal and 14 fragments of uncharred wood were recovered from the feature, weighing less than 4 g. The 2.0 $ft.^3$ of sediments excavated from Feature 4 yielded 41 artifacts (20.5 artifacts/$ft.^3$), consisting of a tobacco pipe stem, a fragment of dark olive bottle glass, 19 fragments of flat glass, 12 small fragments of brick (11 English and 2 American), 1 complete 9d size square nails, 6 unidentified nail fragments, and a piece of buckshot.

Feature 8 was another footing feature defined by OAS and excavated in 1999. The remaining portion in N30, W280, was about 2.6 ft. long north-south (perpendicular to the stockade) by 1.5 ft. wide east-west (see Figures 7 and 11). A small portion of the footing to the south had been removed previously by OAS in 1986. The top of the footing was encountered at about 1.3 ft. below datum and it extended to about 1.6 ft. below datum. The remaining dish-shaped pit prepared for the footing was estimated to be about 3.1 ft. north-south by 2.6 ft. east-west. Like Feature 4, the footing had burnt at a sufficiently high temperature to convert most of the wood to charcoal and ash. Only 13 fragments of wood were recovered, weighing less than 4 g. Bisque, tiny charcoal fragments, nails, flat glass, and some unburnt wood were mixed in the cast of the plank. Bark was recovered from the edge of the feature that appears to be Douglas fir.

Figure 10. Feature 4 during excavation showing charcoal, ash, and bisque staining. Scale is 1 ft.

The 2.4 ft.^{3} of sediments excavated from Feature 8 yielded 67 artifacts (27.9 artifacts/ft.^{3}), consisting of two undecorated white earthenware sherds, a fragment of colorless vessel glass, 1 fragment of dark olive bottle glass, 15 fragments of flat glass, 1 small fragment of American brick, a fragment of roof tile, 45 nails and nail fragments, and a tin can fragment. The nails included a complete Variety 1001 (5d) nail and Variety 1002 spike (60d).

Feature 9905 was defined in Unit N40, W270, as a concentration of artifacts dating to the Hudson's Bay Company occupation of the site. The feature was discovered at the base of Level 5 in Stratum 4 at about 0.95 ft. below datum and it extended to about 1.1 ft. below datum. It was roughly oval in plan view, about 3.3 ft. northwest-southeast (magnetic) by 2.4 ft. northeast-southwest. The southeastern half was lighter in color. The 1.12 ft.^{3} of sediments excavated from Feature 9905 yielded 88 artifacts (78.6 artifacts/ft.^{3}), consisting of 9 undecorated white earthenware sherds, 10 transfer print sherds (including blue transfer print sherds in the Lily pattern, and a red Camilla-pattern rim sherd), a tobacco pipe bowl fragment, 3 fragments of colorless glass, 8 fragments of dark olive green glass, 1 fragment of green glass, 1 green wine bottle kickup fragment, 22 fragments of flat glass, 6 fragments of mammal bone, 7 fragments of American brick, 17 nails and nail fragments, a .56 caliber musket ball, an unidentified metal artifact, and a small piece of coral. The nails included two complete Variety 1001 (12d and 16d), two Variety 1010 (8d and 30d), and one complete yellow metal nail of Variety 2009 (2d). Eleven small pieces of charcoal were recovered.

Figure 11. Feature 8 during excavation, showing extensive areas of bisque and charcoal. Scale is 1 ft. The feature tag (left) was left behind by the 1986 OAS excavators.

Feature 9906 was defined in Unit N35, W275, as a pit. It was recognized in the north wall profile for the unit at about 1.1 ft. below datum within Stratum 4 and extended to 2.1 ft. below datum. The pit was about 3.8 ft. wide and extended about 1.1 ft. south of the north wall profile. Only the sediments from 1.6 to 2.1 ft. below datum were excavated separately as feature fill and no artifacts were recovered from this 1.75 $ft.^3$ of fill. It appears that the upper portions of the pit contained refuse. At the base of Level 7 (1.1-1.3 ft. below datum) a moist stained area was noted in the northern portion of the unit with a lens of ash and charcoal on its eastern side that appears to be associated with the top of the feature. A flow blue sherd and bone (Artifact 107-1) were mapped at the base of this layer in the dark stain. The matrix was a brown to dark brown silt loam with a moderate fine subangular blocky structure.

ARTIFACT DESCRIPTIONS

A total of 5,587 artifacts was recovered from the excavations, including 712 ceramic artifacts (including tobacco pipes), 645 artifacts of non-construction glass (including beads), 886 fragments of flat glass, 860 fragments of brick, mortar, and tile, 848 nails and nail fragments, and 1,000 fragments of wood and charcoal. (Table 3). The largest numbers of artifacts were recovered from N40, W265, and N40, W270, along the north-central edge of the New Office site. It is inferred that a secondary refuse deposit was located in this area. The lowest number of artifacts, not surprising, were found in the disturbed deposits associated with the Water Line Investigation, Unit 1. Consistent with previous excavations at Fort Vancouver, the artifacts were classified to Spragues' (1980-81) functional typology. The identification and analysis of artifacts has relied primarily on Chance and Chance (1976), Chance et al. (1982), Chapman (1993), Ross (1976), and Sussman (1979).

TABLE 3. FREQUENCY OF ARTIFACTS RECOVERED BY 1999 EXCAVATION UNIT

Object	Sprague Classification[1]	N15, W240	N30, W280	N30, W290	N35, W275	N40, W255	N40, W265	N40, W270	UNIT 1	UNIT 2	UNIT 3	TOTAL
CERAMIC												
Stoneware Sherd	II.B.1.		1		2		14	1		2	5	25
Earthenware Sherd	II.B.2.	8	24	27	29		48	69	3	14	43	265
Lustreware Sherd	II.B.2.	2			1							3
Porcelain	II.B.2.										2	2
Porcelain, Chinese	II.B.2.			1			1			2		4
Transferprint Sherd	II.B.2.	1	20	19	30		70	104		23	48	315
Porcelain, Industrial	III.D.				1					1		2
Terracotta Sewer Pipe	VI.E.5.						1					1
Pipe, Tobacco	I.G.	7	6	15	6	1	28	23	1	4	4	95
NON-CONSTRUCTION GLASS												
Bead, Hot Tumbled Tube	I.C.		1				2					3
Bead, Wire Wound	I.C.		2	2			1	1		1		7
Bead, Modern	Modern			4								4
Glass Rod and Strips	V.I.2.									5		5
Mirror	I.D.	1	2				1			3		7
Medicine Bottle	I.E.	1										1
Bottle Glass, Dark Olive	I.G.	7	18	31	48		75	95	1	18	17	310
Brandy/rum Bottle	I.G.						3					3
Wine Bottle	I.G.							1		1		2
Table Glass	II.B.2.								1	1		2
Tumbler	II.B.2.		1					2		2		5
Wine Stem	II.B.2.							1				1
Lamp Glass	II.B.3.				3			2	1	3		9
Bottle Glass, Amber	VIII.B.	4		1	1		4	1	3	2	2	18
Bottle Glass, Aqua	VIII.B.	2		4			10		1	2	1	20
Bottle Glass, Clear	VIII.B.	9	17	15	21		22	19	6	10	5	124
Bottle Glass, Green	VIII.B.		10	8	22		23	2	6	3	3	77
Bottle Glass, Light Aqua	VIII.B.		1	3	4		2	5			3	18
Bottle Glass, Light Green	VIII.B.		2	1	1				1	2	3	10
Non-construction Glass	VIII.B.			2	1			2	1	3		9
Panel Bottle	VIII.B.						2	4		2	2	10

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TABLE 3, CONTINUED

Object	Sprague Classification[1]	N15, W240	N30, W280	N30, W290	N35, W275	N40, W255	N40, W265	N40, W270	UNIT 1	UNIT 2	UNIT 3	TOTAL
OTHER												
Button	I.A.			1	1			1		1		4
Textile Ribbon	I.A.						3					3
Tooth	II.B.1.						7					7
Bone, Unworked	II.B.2.		1	2	20		169	43		8	130	373
Shell, Unworked Mollusk	II.B.2.										9	9
Ferrous Knife Handle	II.B.2.						1					1
Asphalt	III.B.1.		3	1					37			41
Brick	III.B.1.		7	5	10		13	8			1	44
Brick, American	III.B.1.	23	31	36			278	52	49	14	6	489
Brick, English	III.B.1.	3	62	29	6		37	33	3		54	227
Mortar	III.B.1.		18	5	2		2	9			1	37
Mortar, Coral	III.B.1.				1			1			25	27
Tile, Masonry	III.B.1.	1										1
Tile, Roof	III.B.1.		10	18	6		1					35
Flat Glass	III.B.1.	152	115	58	57		246	192	4	27	35	886
Wood	III.B.1.	21	89	78	354		151	39		4	192	928
Charcoal	III.B.1.			2			65	15				82
Cut Nail	III.B.2.	2	19	9	4	2		2	7	7	5	57
Wrought Nail	III.B.2.	4	20	14	8		6	14	1	2	6	75
Wire Nail	III.B.2.	1	4	3	2			1	23	32	20	86
Yellow Metal Nail	III.B.2.		2	1	3		3	5			1	15
Unidentified Square Nail	III.B.2.	57	82	126	69		146	122		2	7	611
Unidentified Nail Fragments	III.B.2.		3									3
Unidentified Nail	III.B.2.	1										1
Ferrous Washer	III.B.2.			1								1
Screw	III.B.2.	1										1
Clinker	V.I.2.			1			2					3
Coal	V.I.2.	4	6		4		42	3		17	13	89
Chalk	V.J.			2								2
Pencil, Lead	V.J.			1								1
Pencil, Slate	V.J.							1				1
Yellow Pigment or Crayon	V.J.						1					1
Currency	V.J.4.									1		1

Continued on next page

TABLE 3, CONTINUED

Object	Sprague Classification[1]	N15, W240	N30, W280	N30, W290	N35, W275	N40, W255	N40, W265	N40, W270	UNIT 1	UNIT 2	UNIT 3	TOTAL
Cartridge	VI.B.4.	1										1
Shot	V.B. or VI.B.4.						2	2				4
Spent Bullet	V.B. or VI.B.4.			2								2
Wood Object	VIII.							1				1
Ferrous Metal Artifact	VIII.A.			1								1
Ferrous Strap with Rivet	VIII.A.						1					1
Tin Can Fragment	VIII.A.	4	1	5	2			4		1	9	26
Unidentified Metal	VIII.A.							1				1
Watch Part?	VIII.A.										1	1
Wire	VIII.A.			4			2		6	5	4	21
Bottle Cap	Modern								1			1
Cigarette Filter	Modern			1			1					2
Clothing Zipper	Modern						1					1
Foil	Modern								1			1
Native Chert	Modern		2									2
Plastic Toy Soldier	Modern		1									1
Bisque	Sample		4		1		4					9
Basalt Debitage	Prehistoric			1	1						1	3
Chert Debitage	Prehistoric		1	1	1		2	1			1	7
Projectile Point	Prehistoric	1										1
Quartzite Debitage	Prehistoric						1					1
TOTAL		318	586	541	722	3	1,494	882	157	225	659	5,587

1. Sprague (1980-81) categories: I. Personal Items, II. Domestic Items, III. Architecture, IV. Personal and Domestic Transportation, V. Commerce and Industry, VI. Group Services, VII. Group Ritual, VIII. Unknowns, Modern = modern artifact (not classified), Prehistoric = prehistoric/historic Native American artifact (not classified), subcategories are listed in Sprague (1980-81).

Ceramics

Excluding tobacco pipes and bricks, ceramic artifacts numbered 617, of which 474 originated from the New Office Investigation (Table 4). Of these, 95% were earthenware container fragments. Transfer-printed wares comprised over half of the earthenware sherds, most in blue transfer-print patterns. At least 14 different identified patterns were noted in blue, black, flow blue, green, and red colors. All of the patterns recognized in the New Office Investigation were of the Copeland/Spode variety, with the blue transfer print "Lily" pattern the most common, and the "Broseley" pattern the next most common. Due to the high degree of fragmentation, many of the transfer-printed sherds were not identifiable. Undecorated white, clear-glaze fragments comprised the next most numerous type of earthenware after transfer-printed wares, representing 42 % of the earthenwares. A variety of other types of earthenware were noted, including two sherds of mocha ware and three sherds of lustre ware. Only two tiny fragments of Chinese porcelain were recovered and stoneware sherds numbered only 18. These included a stoneware bottle fragment from level 6 of N40, W265, and rim and possible body fragments of a Day & Martin liquid blacking bottle from levels 5 and 7 of N40, W265. Based on the cross-mending rim sherds, the bottles outer diameter at the lip is 59.4 mm with a 44.5 mm orifice, narrowing to 36.6 mm at the neck. A fragment of terra-cotta sewer pipe was noted in the Stratum 3 deposits of N40, W265 (Level 3). An industrial porcelain insulator fragment was found in Stratum 3 of N35, W275 (Level 3).

The 143 sherds recovered from the Waterline and Stockade Investigations were also dominated by earthenware, including at least 11 different transfer-print patterns (Table 5). Of note, large fragments of a Davenport "Muleteer" pattern plate in mulberry and a mulberry Robinson & Wood "Venetian Scenery" hollowware body sherd were recovered from Unit 2, Level 4 (Stratum 2). Porcelain numbered only 5 sherds, including 1 fragment of an electrical insulator. There were 7 stoneware sherds recovered, including a stoneware ale bottle sherd that was recovered from Level 5 of Unit 2 (Stratum 2).

Over 75% of the sherds, regardless of excavation unit, exhibited signs of post-discard alteration in the form of burning, potlidding (30.9%), and slip removal through burning or abrasion (46%). It is likely that materials around the New Office were trampled by Hudson's Bay Company or U.S. Army personnel or fragmented during use of the army road. Some of the refuse found around the New Office may have been burnt prior to disposal, or it is possible that the burning of the New Office in the mid-1860s resulted in damage to the artifacts deposited around it.

The sherds in the New Office site are significantly smaller in size than those in the Waterline/Stockade Investigation. As shown in Table 6, nearly half of the sherds recovered from the New Office are 6 mm in maximum length or smaller and only a small proportion exceed 15 mm in maximum length. In contrast, relatively few sherds from the Waterline/Stockade Investigation are 6 mm or smaller and a relatively high proportion are greater than 15 mm in maximum length. This suggests that trampling (including fragmentation caused by the road) was more intensive around the New Office building, which would be expected if there were footpaths, roads, or other activity areas on the edges of the New Office building. The larger sherd size for the Waterline/Stockade Investigation is due to less traffic, lower overall use of the

TABLE 4. CERAMIC ARTIFACTS RECOVERED FROM THE NEW OFFICE INVESTIGATIONS

TYPE	Attribute				TOTAL
	Body	Base/ Footring	Handle	Rim	
Earthenware (n=452)					
Transfer Printed Wares (n=244)					
Aesop's Fables (Blue)				1	1
Alhambra (Blue)	4		2	2	8
British Flowers (Blue)	1			1	2
Broseley (Blue)	9	2		3	14
Byron Views (Blue)			1		1
Camilla (Blue)	4				4
Camilla (Red)				1	1
Lily (Blue)	34			16	50
Macaw/Pagoda (Blue)				1	1
Rose and Sprigs (Black)				1	1
Temple (Blue)	2			1	3
Tower (Blue)			5		5
Warwick? (Blue)	1				1
Willow (Blue)	2			1	3
Unidentified Black Fragments				1	1
Unidentified Blue Fragments	132	1	1	5	139
Unidentified Flow Blue Fragments	6				6
Unidentified Green Fragments	2				2
Unidentified Red Fragments				1	1
Mochaware	1			1	2
Lustreware, White Interior Glaze	3				3
Black Slip White Paste Ware Fragments	1				1
Blue Slip White Paste Ware Fragments	3				3
Yellow Slip White Paste Ware Fragments	1				1
Redware	1				1
Undecorated White Clear Glaze Fragments	175	6	1	9	191
Other	4	1		1	6
Porcelain (n=3)					
Blue and White Chinese	1			1	2
Insulator fragment	1				1
Stoneware (n=18)					
Black Salt Glaze, Unglazed Interior	1				1
Brown Salt Glazed	6				6
Brown Salt Glaze, Interior Light Gray Glaze	4				4
Brown Salt Glaze, Unglazed Interior	3			4	7
Terracotta Sewer Pipe	1				1
TOTAL	403	10	10	51	474

area, and probably because some of the artifacts were deposited in the privy feature which would have removed them from contexts subject to trampling. Interestingly, the condition of the sherds from the Waterline/Stockade Investigation are just as poor in terms of traces of burning and abrasion. While they are larger in size, they appear to have suffered many of the same post-discard impacts as those deposited at the New Office site.

TABLE 5. CERAMIC ARTIFACTS RECOVERED FROM THE WATERLINE/STOCKADE INVESTIGATIONS

TYPE	Attribute				TOTAL
	Body	Base/ Footring	Handle	Rim	
Earthenware (n=131)					
Transfer Printed Wares (n=71)					
Alhambra (Blue)	1				1
Beverley (Blue)				1	1
British Flowers (Blue)	3			1	4
Camilla (Blue)	1				1
Camilla (Green)				1	1
Camilla (Red)				1	1
Lily (Blue)	3			3	6
Muleteer (Mulberry)	2				2
Seasons (Blue)	1				1
Seasons (Green)				1	1
Venetian Scenery (Mulberry)	1				1
Unidentified Black Fragments	1				1
Unidentified Blue Fragments	42	1		3	46
Unidentified Brown Fragments	1				1
Unidentified Green Fragments	1				1
Unidentified Red Fragments	2				2
Hand-painted	3	1		1	5
Blue Slip White Paste Ware Fragments	1				1
Yellow Slip White Paste Ware Fragments	1				1
Undecorated White Clear Glaze Fragments	48	1	1	2	52
Other	1				1
Porcelain (n=5)				71	
Hand-painted	2				2
Chinese	2				2
Insulator fragment	1				1
Stoneware (n=7)					
Brown Glazed	1				1
Brown Salt Glazed	2				2
Brown Salt Glaze, Unglazed Interior	1				1
Light Green Exterior Glaze, Brown Interior	1				1
Unglazed	2				2
TOTAL	125	3	1	85	214

The refuse deposits inferred in Stratum 4, Units N35, W275, and N40, W265-270, tend to contain a higher proportion of larger sherds than Stratum 4 deposits in other New Office units (Table 6). This provides additional support that these materials represent secondary refuse as larger artifacts tend to be more hindering and are more likely to be removed from their location of use to become secondary refuse. After deposition, these materials were undoubtedly subjected to additional trampling and possibly burning, but overall sherd attrition appears to be less than for other areas at the New Office.

TABLE 6. SHERD SIZE ANALYSIS

AREA	Sherds ≤ 6 mm in maximum length		Sherds > 15 mm in maximum length	
	n	%	n	%
New Office Investigation	216	45.6%	62	13.1%
Waterline/Stockade Investigation	28	19.6%	46	33.2%
Stratum 4 New Office Secondary Refuse	145	44.8%	47	14.5%
Stratum 4 New Office Elsewhere	34	46.6%	4	5.5%

Tobacco Pipes

A total of 95 clay tobacco pipe fragments was recovered from the excavations, including 22 fragments of bowls and 73 stem fragments. There was only one diagnostic artifact, consisting of a bowl fragment with a complete spur containing the I/F marks. This is a FOVA Style 4 pipe, which was manufactured by John, Jesse & Thomas Ford in Stepney, England, between 1830 and the 1870s. It was recovered from Caywood's backdirt (Feature 2) in N30, W290. Other pipe bowl fragments included one with an asterisk, one with fluting, and one with an incised line. The highest concentration of tobacco pipes was in the trash deposits associated with N40, W265-270. Notable numbers were also recovered in N30, W290.

Beads, Glass Rod, and Glass Strips

Fourteen beads were recovered from the excavations. A single translucent blue bead was found in the Stockade Investigation with the remainder found in the New Office Investigation. The characteristics of the beads are shown in Table 7. As shown in the table, wire wound and hot-tumbled tube beads were identified. Four modern beads were recovered, all from N30, W290, Strata 2a, 3, and 4. Given the presence of modern beads in this unit, one of which was found in Stratum 4, it is quite possible that the wire-wound Variety 2052 bead found in this unit may also be modern in origin. Beads were found in all of the units along the north wall of the New Office except for N35, W275. No beads were recovered from Unit N15, W240.

One glass rod and four glass strips were recovered from Stratum 2 in Unit 2 (Table 7). The rod is opaque-white in color while the strips include colorless, opaque white, amber, and aqua colors. Two of the strips contain grooves on one of the flat sides. Similar objects were recovered in the F158 privy feature by Hoffman and Ross (1972:48, 51-52) during the excavation of the Bakehouse. Hoffman and Ross note the similarity in color of these objects with beads found at the site.

TABLE 7. CHARACTERISTICS OF BEADS, GLASS ROD, AND GLASS STRIPS

Lot	Spec. UNIT	Level	Feature /Stratum	Description	Length (mm)	Diameter (mm)
6	3 UNIT 2	2	STR. 2	Wire wound, Variety 2018, translucent blue	2.73	4.74
24	2 N30, W280	3	STR. 3	Hot tumbled tube bead, Variety 1063, translucent blue	3.69	3.62
25	6 N30, W280	4	STR. 3	Wire wound, Variety 2018, translucent blue	2.94	4.77
29	3 N30, W280	6	STR. 4	Wire wound, Variety 2018, translucent blue	2.9	4.74
35	3 N30, W290	2	STR. 2A	Modern, hot tumbled tube bead, orange	1.32	2.31
35	3 N30, W290	2	STR. 2A	Modern, hot tumbled tube bead, red	1.77	2.46
38	8 N30, W290	4	STR. 3	Wire wound, Variety 2052?, dark purplish-blue	3.11	4.95
38	8 N30, W290	4	STR. 3	Modern, 2-piece red plastic? bead	8.43	8.1
40	6 N30, W290	5	STR. 4	Modern, hot tumbled tube bead, orange	1.55	2.31
47	1 N30, W290	9	STR. 4	Wire wound, Variety 2052, dark purplish-blue	3.56	4.93
73	6 N40, W265	6	STR. 4	Wire wound, Variety 2005, blue	5.88	6.67
77	8 N40, W265	7	STR. 4	Hot tumbled tube bead, Variety 1040, opaque white on opaque white	3.25	3.96
78	6 N40, W265	8	STR. 4	Hot tumbled tube bead, Variety 1040, opaque white on opaque white	3.03	4.02
99	1 N40, W270	7	STR. 4	Wire wound, Variety 2018, translucent blue	3.77	5.12
10	2 UNIT 2	4	STR. 2	Glass strip, colorless, 8 grooves	23.58 x 5.97 x 1.18	
12	2 UNIT 2	5	STR. 2	Glass strip, amber, 10 with grooves	37.03 x 6.27 x 1.24	
14	3 UNIT 2	6	STR. 2	Glass strip, aqua	24.66 x 5.75 x 0.94	
14	3 UNIT 2	6	STR. 2	Glass strip, opaque white	52.29 x 8.26 x 1.31	
14	3 UNIT 2	6	STR. 2	Glass rod, opaque white	11.46 x 1.45 Diam.	

Mirror Glass

Seven fragments of mirrors were recovered. These were identified on the basis of remnant backing. Unit 2 contained three fragments, while the remainder were found scattered in three units associated with the New Office. Only one mirror fragment was found in the refuse concentration associated with N40, W265.

Vessel Glass

Vessel glass totaled 601 fragments, most of which were the body sherds of bottle glass in various colors. The only possible medicinal container recovered was a colorless finish with a prescription lip that was recovered from N15, W240, Level 2, (Stratum 4). This artifact contained a 22.4 mm diameter rim with a 10.8 mm orifice that narrowed to 9.9 mm at the neck. The remaining portion of the finish is 19 mm long.

There were only three diagnostic dark olive green glass bottle bases recovered, all from the refuse deposits of N40, W265, Levels 6 and 8. These were all fragments of bottles (probably

one-piece dip-mold) with deep cone-shaped push-ups. These are generally attributed to brandy or rum bottles. Another small base fragment from Level 5 of N40, W265, appears to be from a similar bottle and a small finish fragment with lead seal residues, found in Level 7 of N40, W270, is also probably from a brandy, rum, or wine bottle. A dark olive green finish with a hand-applied wrap collar is probably part of a wine or champagne bottle. It was found in Level 2 of Unit 2 of the Stockade Investigations. A green bottle base fragment found in Feature 9905 of N40, W270, contains a deep push up and also probably is the remains of a wine or champagne bottle. Including the one small base and finish fragments noted above, 310 fragments of dark olive green glass bottles were identified, with all but three of which consisting of body fragments. Over 65% of these fragments (n=203) originated in the refuse deposits associated with N35, W275, and N40, W265-270 (Table 3). N30, W290 also contained a relatively high frequency of dark olive green glass, of which 20 fragments originated from undisturbed 19th century deposits.

After dark green bottle glass, colorless bottle glass fragments were the next most frequent, consisting of 2 finish/collar fragments, 121 body fragments, and one melted (possible body) fragment. Colorless bottle fragments were fairly evenly distributed across the north wall units of the New Office, but were relatively scarce in N15, W240, and Units 1-3 of the Waterline/Stockade Investigation. Green bottle glass fragments, all representing body portions of the vessel, were more highly concentrated in N35, W275, and in N40, W265. Aqua glass tended to be more highly concentrated in N40, W265, but amber, light aqua, and light green glass fragments were relatively evenly distributed across the excavation units at the New Office site.

Ten body fragments attributed to rectangular panel-type bottles were recovered. Two of these were colorless, one found in the Caywood-disturbed materials associated with N40, W265, and embossed with a ". . . T . . . " on the panel, and one found in Level 5 of N40, W270, and embossed with an " . . . N . . ." on the panel. An amber panel bottle fragment, embossed with an " . . . O . . ." was found in Level 2 of Unit 2 of the Stockade Investigation. Seven light-aqua panel bottle fragments were recovered, of which four originated from Stratum 4 deposits in Levels 6 and 7 of N40, W265-270. While three of these contained fragments of embossing, only one of which was readable, containing an " . . . N . . ." on the panel.

Unlike the ceramic artifacts, which contained abundant evidence for heat-alteration, there were only nine glass fragments that were melted and only five that exhibited discoloration or other signs of burning. Most of the fragments contained no evidence for exposure to heat. If the New Office was burnt, the temperatures were not sufficiently high to alter many of the glass materials adjacent to it.

Like the analysis of size for ceramic sherds, the New Office vessel glass was much more highly fragmented than the materials from the Waterline/Stockade Investigations. Over 30% of the vessel glass fragments recovered from the New Office are under 6 mm in maximum length (n=163), while only 8% of the vessel glass fragments from the Waterline/Stockade Investigation are smaller than 6 mm (n=9). Only about 13% of the vessel glass fragments from the New Office are over 15 mm in maximum length (n=69), while about 44% of the vessel glass fragments from the Waterline/Stockade Investigations are greater than 15 mm (n=46). Unlike the results for ceramic artifacts, the vessel glass fragments in the refuse deposits associated with N35, W275,

and N40, W265-270, are about the same size as the vessel glass from units elsewhere in the New Office Investigation.

Table Glass

Only eight fragments of table glass were identified, consisting of colorless glass tumbler rims, none of which were found in undisturbed contexts. The single colorless wine stem base was found in Level 5 (Stratum 4) of N40, W270. The exterior edge of the base is 3.43 mm in thickness, thickening to 5.93 mm near its center. Two fragments of pressed glass were recovered from disturbed contexts in Units 1 and 2. One of these may represent part of a headlamp for an automobile.

Lamp Glass

Very thin, curved, colorless glass fragments, attributed to kerosene lamp chimneys were found in Units 1 and 2 on the Waterline/Stockade Investigation. The few fragments found in the New Office area were from Levels 5-7 (Stratum 4) of N35, W275, and in Level 3 (Stratum 3) and Level 5 (Stratum 4) of N40, W270.

Buttons and Textiles

Four fragments of metal buttons were identified. Three of these were fragments of three-piece buttons, consisting of (1) a ferrous metal face plate, 13.27 mm in diameter, which was recovered from Unit 2, (2) a cupreous face plate and eye, unknown diameter, recovered from Level 6 (Stratum 4) of N40, W270, and (3) a cupreous face plate, 6.79 mm in diameter, found in Level 5 (Stratum 4) of N30, W290. A possible cupreous button fragment, 6.83 mm in diameter, was recovered from Level 3 (Stratum 3) of N35, W275. Three fragments of what appear to be fabric strips or ribbon were recovered from Levels 7 and 8 of N40, W265. These are interpreted as fragments of clothing.

Bone and Shell

Faunal remains recovered from the excavations numbered 376 fragments, including 3 teeth, 11 bird bones, 358 mammal bones, and 4 unidentified fragments. The largest number of bones and bone fragments were recovered in Unit N40, W265, with lower numbers found in N35, W275, and N40, W270, all associated with the inferred secondary refuse deposit in that area. Other areas of the New Office excavations contained few or no bones. Most of the bones recovered from the New Office Investigation were found in undisturbed 19th century deposits, with only five bones recovered from disturbed contexts (Stratum 3 and Feature 2).

For the Stockade Investigation, 130 bones and all 9 of the mollusk shells were found in Unit 3. Unit 1 contained no bones and Unit 2 contained only 8 bones. The close association of Unit 3 with the disturbed human burial found during the 1972 Bakehouse excavations suggests that some of the bones recovered from Unit 3 could be human remains. Given this possibility, and the overall importance of the bones for the interpretation of food consumption and use at the

site, it is recommended that all of the bones be analyzed by a specialist for species and element determination and a characterization of their taphonomic attributes.

Ferrous Knife Handle

A table knife handle of ferrous metal with a partial blade was recovered from the top of Level 6 of N40, W265. Its remaining length is 146.8 mm. It appears to date to the U.S. Army period use of the area, probably late in the 19th century.

Brick, Tile, and Mortar

A total of 760 fragments of brick were recovered from the investigations, including 489 attributed to local "American" sources, 227 English stock brick fragments, and 44 unidentified brick fragments. Most of the brick fragments were associated with the refuse deposits in N40, W265-270, in N30, W280, and in N30, W290. While one could make the inference that the amount of brick in these units is suggestive of one or more chimneys on the north side of the New Office, it is important to note that 98% of the American fragments, 91% of the English fragments, and all of the unidentified fragments were very small in size, 5 cm in maximum dimension or less. Highly fragmented brick fragments are suggestive of maintenance, refuse disposal processes, and post-depositional trampling, not *in situ* architectural remains. Notable numbers of small-sized brick fragments were also found in Unit 3.

There were only 10 American brick fragments greater than 5 cm in maximum dimension and only 6 of these were found in undisturbed 19th century strata. One of these was found in Level 2 of N15, W240, one in Level 6 of N30, W290, and four in Level 7 of N40, W265. There were 21 English brick fragments greater than 5 cm in maximum dimension, with 17 found in undisturbed 19th century strata. One was found in association with Feature 9903 of N30, W280, three in N30, W290, one in N35, W265, three in N40, W265, and nine in N40, W270. Clearly, there is a large amount of brick refuse along the north wall of the New Office and some of it represents larger-sized fragments, but there do not appear to be enough bricks to infer an architectural feature. Few of these bricks probably originated in the New Office building and they likely represent secondary refuse associated with an earlier structure or materials that were maintained from other areas of the fort and discarded along the north wall of the structure.

Those brick fragments containing measurable dimensions numbered only eight (7 English and 1 American) and only three fragments (two which also contained measurable dimensions) contained the distinctive "W" maker's mark, found on English stock bricks at Fort Vancouver (Table 8). Seven of the brick fragments were about 2.5 to 2.75 inches thick, and otherwise conform closely with Gurke's (1981) Type 01 brick. A single 2-inch thick Type 05 ("American") brick fragment was found in Level 2 (Stratum 4) of N15, W240, and a thinner (1.4-inch) English brick of unknown type was found in Level 7 of N35, W275. Four of the diagnostic brick fragments originated in Stratum 4 of N40, W270, and were associated with the inferred secondary refuse deposit. The diagnostic American brick fragment (Gurke's Type 05) was recovered from the southeast corner of the New Office in N15, W240, while two of the diagnostic English brick fragments were recovered from Stratum 4 in N30, W290. For the Stockade Investigation, only a single diagnostic brick fragment was found, in Level 4 of Unit 3.

A total of 35 fragments of roofing tile was recovered, all from the New Office Investigation. Of these, 32 could be measured for thickness, which yielded a mean thickness of 12.6 mm (0.7 standard deviation). One fragment contained a fastener hole. Like the previous results from excavations at the New Office (Hibbs 1987:41; Thomas 1995:21), roof tile fragments were found almost exclusively in the eastern portion of the excavation in units associated with the 1829-1836/37 stockade or to the west (Table 3). These tiles probably derive from a building in the northeast corner of the earlier stockade and are probably not associated with the New Office building. A single fragment of masonry tile, 26 mm in maximum length, was recovered from Level 2 of N15, W240, in the southwestern corner of the New Office.

TABLE 8. CHARACTERISTICS OF DIAGNOSTIC BRICK FRAGMENTS

Lot	Spec. No.	UNIT	Level	Stratum	Type (Gurke)	Max. L (mm)	W (mm)	T (mm)	Surface Modification
16	1	UNIT 3	4	STR. 3	01	105	105	71.5	
40	2	N30, W290	5	STR. 4	01	100		67	
55	2	N35, W275	7	STR. 4	Unk.	57		35	
90	1	N40, W270	6	STR. 4	01	150	107	67	W" mark and thumb imprint
92	2	N40, W270	6	STR. 4	01	75			Partial "W" mark
94	1	N40, W270	7	STR. 4	01	67		61	
103	1	N15, W240	2	STR. 4	05	118		53	
109	1	N30, W290	Profile	STR. 4	01	80		62	
110	1	N40, W270	Profile	STR. 4	01	175	110	70	W" mark and thumb imprint

Notes: Max. L = maximum length of artifact., W = width of brick, T = thickness of brick.

A total of 52 fragments of mortar, weighing 140 g, was recovered from the excavations, 16 of which (76 g) were from the Stockade Investigation. The Hudson's Bay Company imported coral from the Hawaiian Islands for use as mortar. All of the 15 fragments of coral mortar (74 g) and 10 (10 g) of the 12 fragments of raw coral originated in Unit 3. The other two fragments of raw coral came from Stratum 4 of N35, W275, and Feature 9905 of N40, W270. Most of the other non-coral mortar fragments were found in N30, W280 (n=18 fragments, 32 g), with 9 fragments (14 g) found in N40, W270, and a few pieces found each in N30, W290; N35, W275; and N40, W265.

Most of those materials identified as tar or asphalt were found in Statum 3 or disturbed contexts and, in general, were not collected. A sample of tar/asphalt was collected from Levels 3 and 4 of Unit 1, Level 6 (Stratum 4) of N30, W280, and Level 3 (Stratum 2B) of N30, W290. With the exception of the three fragments from N30, W280, all of the asphalt appears to be related to the U.S. Army Spruce Mill or later use of the site. The materials from N30, W280, are of unknown function and may be intrusive.

Flat Glass

A total of 886 pieces of flat glass (excluding mirror glass) was collected, with the majority recovered from the New Office Investigation (n=820, 92%), and with most recovered

from undisturbed strata and features dating to the 19th century (Table 9). Stratum 4 and Features 4, 8, 9903, and 9905, in the New Office area, yielded together 730 pieces of flat glass, 82% of the collection. Unit 1 contained only 4 pieces of flat glass, while Units 2 and 3 contained only 27 and 35 pieces respectively. Flat glass in Stratum 3 of the New Office Investigation is probably associated with Caywood's trenching operations or other, later, archaeological disturbance. Most of the flat glass tended to be colorless or very slightly tinted (n=655, 74%), with 21% (n=185) exhibiting a notable light green tint, and 5% (n=46) exhibiting a light-aqua tint. While some of the recovered flat glass undoubtedly represents fragments of mirrors or the flat elements of panel bottles, the vast majority are inferred to be fragments of window panes.

TABLE 9. FLAT GLASS FRAGMENTS BY EXCAVATION UNIT

	All Contexts		No. in 19th Century Deposits	
UNIT	No.	%	No.	%
N15, W240	152	17.2%	144	19.7%
N30, W280	115	13.0%	102	14.0%
N30, W290	58	6.5%	36	4.9%
N35, W275	57	6.4%	52	7.1%
N40, W265	246	27.8%	213	29.2%
N40, W270	192	21.7%	183	25.1%
UNIT 1	4	0.5%		
UNIT 2	27	3.0%		
UNIT 3	35	4.0%		
TOTAL	886		730	

Chance and Chance (1976:248-255) noted that the mode thickness of samples of flat glass fragments from Kanaka Village, Vancouver Barracks, and Fort Vancouver, increased through time during the 19th century (see also Roenke [1978]). Previous work by OAS in 1986 along the north wall of the New Office (Hibbs 1987) identified a single mode for flat glass from undisturbed 19th century strata at 0.05 inch (n=389). Based on the Chance and Chance chronology, this corresponds to glass manufactured between 1830 and 1845. All of the flat glass from the 1999 excavations was measured for thickness to 0.01 mm using a Mitutoyo digimatic caliper (Model CD-6" CS) and converted to inches for comparability with the Chance and Chance chronology.

Examination of flat glass thickness by 1999 excavation unit for intact 19th century contexts suggests greater variability in the distributions than that described for the 1986 excavations (Figure 12). Most of the primary modes for the units are in the intervals between 0.041 and 0.050 inches, which according to the Chance and Chance (1976) chronology, correlates to glass manufactured between 1830 and 1840. The distributions of glass thickness for N30, W290 and N40, W265, however, are distinctively bimodal, with secondary modes at 0.056-.060 for N30, W290, and at 0.061-.065 for N40, W265. Further, there are considerable numbers of flat glass fragments that exceed 0.065 inch in thickness. These thicker modes suggest replacement of glass panes during the use of the building between 1845 and 1860. There are few fragments exhibiting thicknesses greater than 0.08 inches, consistent with the abandonment and

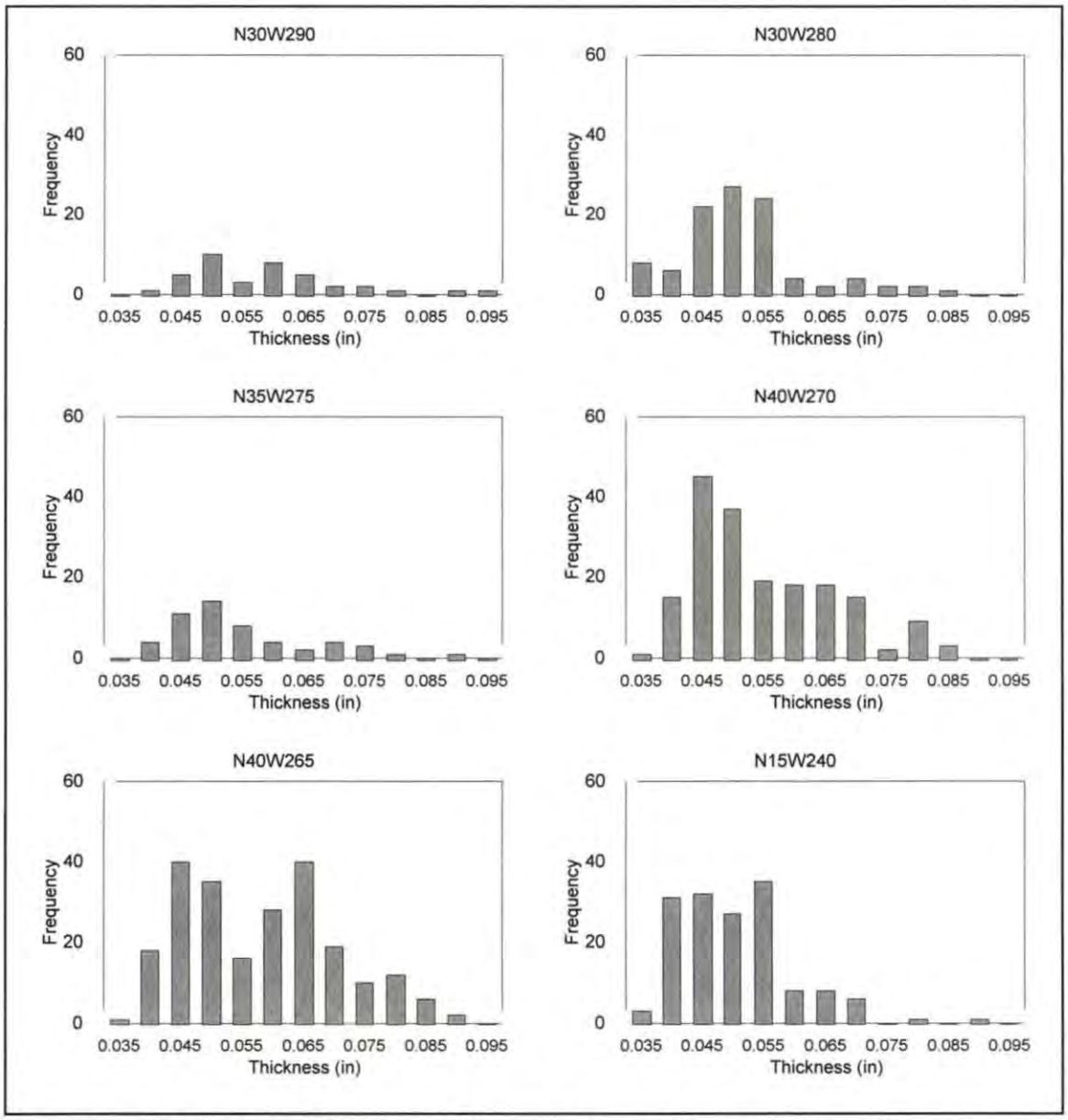

Figure 12. Distribution of flat glass thickness by New Office 1999 excavation unit.

demolition of the building in the 1860s. In sum, the variability in glass thickness by units appears to reflect patterns of window breakage and replacement along the north wall during the use of the New Office building. While some of the flat glass could represent materials from an earlier structure at the same location, it is believed that most of the flat glass represents materials from the New Office.

As shown in Table 9 and Figure 12 , the quantities of flat glass also vary significantly between units. Only 37 pieces of flat glass were recovered from undisturbed 19th century deposits associated with N30, W290, while only 52 were recovered from N35, W275. In contrast, the other New Office units each contained over 100 pieces of flat glass with N40,

W265, containing over 200 pieces. This variability in flat glass density cannot be explained volumetrically, as most of the units contained relatively minor disturbance by Caywood's excavations (see Table 2).

Of the excavation units, only N15, W240, on the east wall of the New Office is known though documentary evidence (the 1846-1847 Coode watercolor) to have been associated with a window. If this unit can be used as a model for window breakage debris associated with a double-sash, 24-pane window, then similar-sized windows may have existed on the north wall of the New Office near N40, W265. By this same reasoning, there may have been another window at N30, W280.

Given the association of N40, W265, and N40, W270, with a secondary refuse deposit, it is possible that some of the flat glass in these units is secondary refuse deriving from another structure, rather than primary refuse associated with the breakage of New Office windows. This hypothesis is not viable for two reasons. For one, the amount of glass in these units is not dramatically greater than that observed in N15, W240. This suggests that the density of glass in these units is not much greater than the density of glass in a unit that is known to have been associated with a window. For two, the size of the glass fragments is not dramatically different from that of other New Office excavation units. Those fragments of flat glass 6 mm in maximum dimension or smaller represented 36 % of the materials in N20, W265, and 48% in N40, W270. The percentage of flat glass of this size for the other New Office units ranged between 28% for N15, W240, and 60% in N35, W275. In contrast, Only about 11% of the flat glass in the Stockade/Waterline Investigations were 6 mm or smaller.

Wood and Charcoal

A total of 82 pieces of charcoal and 928 fragments of unburnt wood were recovered from the excavations, of which 196 fragments of wood (928 g) originated from the Waterline/Stockade Investigations. Most of this wood (by weight) was a sample of Feature 9902 (844 g) associated with the 1918 Spruce Mill slash burner.

Most of the wood and charcoal from the New Office appears to be architectural wood associated with the footing features. Feature 3 of N35, W275 contained about 60 fragments of wood, weighing 1,336 g. Wood fragments were distributed sparsely throughout the undisturbed 19th century deposits of the New Office units. Relatively large numbers of charcoal fragments were recovered from the footing remnant, Feature 4, and related strata of N40, W265-270.

Nails

A total of 848 nails was recovered from the excavations, of which 86 were wire nails, 57 were machine-cut square nails, 75 were wrought nails, 15 were yellow metal nails, 610 were unidentified square nails and nail fragments, and 5 were unidentified nails and nail fragments. Of these, 113 were from the Waterline/Stockade Investigation area, consisting of 75 wire nails, 19 machine-cut square nails, 9 wrought nails, 1 yellow metal nail, 8 unidentified square nails, and 1 unidentified nail fragment.

Many of the nails found in the New Office area, especially those associated with the refuse deposits in N35, W275, and N40, W265-270, were in very poor condition. Due to this, many complete nails were assigned to the unidentified square nail category. Fragmentary nails (heads and shanks) generally were also assigned to this category.

Wire Nails. Wire nails generally date to the late 19th and 20th centuries. Wire nails found in the excavations predominantly fell into the 6d to 9d sizes, with most originating from the Waterline/Stockade Investigation area. These are probably related to the Spruce Mill burner. Wire nails were found as deep as Level 4 of Unit 1 and to the base of excavation in Units 2 and 3. There were only 11 wire nails recovered from the New Office excavations, representing a variety of sizes (Table 10). Wire nails were found primarily in the backfill of Caywood's excavations (Feature 2) or in Strata 2 and 3. A few wire nails were found in the uppermost levels of Stratum 4, suggesting some mixing of these deposits during or prior to construction of the Spruce Mill. One wire nail each was found in Level 5 of N30, W280; N35, W275; and N40, W270.

TABLE 10. NAIL TYPES BY SIZE AT THE NEW OFFICE INVESTIGATIONS

COMMON SIZE	WROUGHT NAIL	MACHINE CUT NAIL	UNIDENTIFIED SQUARE NAIL	YELLOW METAL NAIL	WIRE NAIL
60d	1				2
50d	2		1		
40d	3				
30d	3		1		1
20d	4	1			1
16d	4	5	3		1
12d	6	2	2		
10d	6	1	2		
9d	8	3	2		1
8d	8	3	1		2
7d	2	3	3		
6d	5	2	1		1
5d	6	3	2		
4d	1	2	4	1	
3d	1		2	5	
2d				5	
Total Complete Nails	60	25	24	11	9
Fragments	6	13	578	3	2
TOTAL	66	38	602	14	11

Wrought Nails. Large numbers of wrought nails were imported by the Hudson's Bay Company, although some were manufactured on-site. Of the 75 identified hand-wrought nails, there were 59 complete specimens that could be typed. The most common varieties identified were 1001 (n=13), 1002 (n=15), 1009 (n=13), and 1010 (n=15). Varieties 1004 (n=1), 1028 (n=1), and 1049 (n=1) were also identified. Complete wrought nails at the New Office only numbered 60 with a range of sizes represented, including 13 that are 4 inches or greater in length

(20d or greater) (Table 10). Of note, no Variety 1022 nails, manufactured from round stock, were found. Crimped specimens of this variety, have been inferred to be anchors for hinges and hasps to doors and shutters (Hibbs 1987:37). There were four examples of Variety 1009 nails crimped at between 1.5 and 1.75 inches, similar to those Variety 1022 specimens identified by Hibbs. All of these were recovered from Levels 6 and 7 (Stratum 4) of N30, W290. It is unlikely that a door was present near the corner of the building, and these artifacts are more likely to represent the presence of a shutter.

Machine-cut Nails. Machine-cut square nails were used by the Hudson's Bay Company only later in the occupation of Fort Vancouver. They were a very small proportion of the nail inventory in 1844 (see Hibbs 1987) and their presence at the New Office site probably represents repairs to the structure. A total of 37 machine-cut nails were sufficiently complete to identify variety. These were predominantly Varieties 2001 (n=12) and 2002 (n=16), with examples of 2004 (n=4) and 2005 (n=5). In the New Office Investigation, machine cut nails were found in sizes ranging from 4d to 20d (Table 10).

Yellow-metal Nails. Twelve yellow-metal (copper or brass) nails were recovered, consisting of cut and cast varieties: 2009 (n=3), 2026 (n=1), 4002 (n=6), 4003 (n=1), and 4004 (n=1). These nails were used for various specialized uses. Like other nails of this type, all were uniformly small in size (4d or less).

Other Hardware

A single ferrous metal washer and a screw were recovered from the New Office excavations. The washer is a flat washer, 35.63 mm in diameter, with a 13.1 mm hole. It was found in Level 4 (Stratum 3) of N30, W290. The screw was a 2-inch flathead screw found in Level 2 (Stratum 4) of N15, W240.

Coal and Clinker

Coal was found in very low numbers and weights in most of the units. The 89 total fragments of coal represented only 140 g. In the New Office Investigation, coal in undisturbed 19th century deposits was most highly concentrated in N40, W265. Clinker was very rare, with only three small fragments recovered, all from the New Office Investigation.

Writing Implements

Two pieces of chalk, a single piece of pencil lead, a slate pencil fragment, and a fragment of yellow pigment were recovered from the excavations. Of these, the chalk and pencil lead probably post-date the Hudson's Bay Company occupation of the site. The chalk was recovered from Stratum 3 of N30, W290. The fragment of pencil lead was 9.5 mm in length, 1.7 mm in diameter, and was found in Level 5 (the uppermost level of Stratum 4) in N30, W290.

The slate pencil was found in Level 7 (Stratum 4) of N40, W270. Its remaining portion is 11.4 mm in length by 1.5 mm in diameter, and it is octagonal in cross-section. Among other purposes, slate pencils were used with slate tablets to mark tallies. The pencil fragment

represents one of the few "office" related artifacts recovered. The yellow pigment, 20 mm in maximum length, was recovered from Feature 9903 in N40, W265. It is of unknown function.

Currency

A single coin was recovered from the excavations. This is a Lincoln-head penny with a date of 1918 found in Level 5 of Unit 2.

Ammunition

One .45-70 brass cartridge, two musket balls, two pieces of buckshot, and two fragments of a spent bullet were recovered from the excavations, all from in the New Office Investigation. The cartridge was recovered from Level 2 (the uppermost level of Stratum 4) of N15, W240, and it carries a Frankford Arsenal head stamp dating to 1882 (R / ? / 82 / ?). The two complete musket balls were both .56 caliber lead shot. One was recovered from Level 6 (Stratum 4) of N40, W265, while one was recovered from Feature 9905 in N40, W270. The buckshot was 4.76 mm and 6.86 mm in diameter, respectively. The smaller piece was recovered from Feature 4 of N40, W265, while the larger piece was recovered from Level 6 (Stratum 4) of N40, W265. The two fragments of spent lead bullets were recovered from the Caywood backfill (Feature 2) of N30, W290.

Unidentified Wood Object

A small, unidentified wood object, possibly a fragment of a wooden doll or other toy, was recovered from Level 7 (Stratum 4) of N40, W270. It is 16.14 mm in length and 5.55 mm in diameter. It is cylindrical, has been shaped, and contains a small nail or brad that runs entirely through the wood on one of its ends.

Other Metal Artifacts

A number of largely unidentified metal fragments were recovered from the excavations. A fragment of a riveted ferrous metal strap, 58 mm in length, was found in Level 6 (Stratum 4) of N40, W265. An unidentified, ferrous metal artifact, 33 mm in length, cigar-shaped, hollow, and sealed at both ends, was recovered from Level 5 (Stratum 4) of N30, W290.

Small fragments of ferrous sheet metal, inferred as tin can fragments, were recovered in low numbers from many of the excavation units. Of the 16 fragments from the New Office Investigation, most derived from intact 19th century deposits. Small fragments of wire were also found in low numbers throughout the excavation units. Only 5 of the 21 fragments originated from undisturbed 19th century deposits. A small (16.5 mm long) cupreous metal machine part, possibly from a pocket watch or other mechanical instrument, was recovered from Unit 3.

Prehistoric Native American Artifacts

Eleven pieces of lithic debitage and one small projectile point fragment were recovered from the excavations. All but one of these are considered prehistoric or possibly early historic-

period Native American in origin. One basalt fragment from Stratum 2 deposits may be machine-crushed gravel. Two of the pieces of debitage were from Unit 3 of the Stockade Investigation, with the remainder found in the New Office Investigation.

The projectile point fragment is a corner-notched arrow-sized artifact, 11.4 mm in maximum length, with a neck width of 4 mm. It is made of a pink-white opaque chert and was found in Level 3 (Stratum 4) of N15, W240. The debitage is composed of basalt, chert, and quartzite, with the chert found in colors of red, red-brown, yellow-brown, and translucent white. Two of the fragments contained some cortex. Lithic debitage was found in a variety of contexts, of which undisturbed (Stratum 4) contexts consisted of Level 6 of N30, W280, Level 6 of N30, W290, Level 8 of N35, W275, Level 5 of N40, W265, and Level 7 of N40, W270.

Modern Artifacts

Modern artifacts included a bottle cap with plastic liner, cigarette filters, a clothing zipper, foil wrapper fragments, and a plastic toy soldier. Of the modern artifacts found in the New Office Investigation, the plastic toy soldier was found in Level 5 (Stratum 4) of N30, W280, indicating some degree of disturbance to the upper layers of this stratum. The toy soldier is a green, hard plastic WWII-type mine-sweeper, 50.5 mm in height. Other modern artifacts were found in Stratum 2, 3, or disturbed deposits.

DISCUSSION

One of the keys to understanding the use and abandonment of Fort Vancouver on the basis of archaeological evidence is the identification and interpretation of site formation processes. Site formation processes are those mechanisms that affect or transform artifacts after their initial period of use in an activity (Schiffer 1987). The identification of formation processes provides a means to interpret the location, condition, and associations of artifacts as they are recovered by archaeologists. For example, South's (1977) elucidation of the "Brunswick pattern" of refuse disposal for 18th century British-American sites, and King's (1988) analysis of midden locations at historic St. Mary's City are two important examples of the importance of spatial patterning and the interpretation of refuse deposits at historical sites. These elements of site formation processes are of particular concern for the present study of the New Office site. While there has been some attention to the spatial distribution of artifacts at Fort Vancouver (e.g., Hibbs 1987; Steele et al. 1975; Thomas 1995), the interpretation of that patterning most often has assumed Pompeii-like conditions, which given the long use and gradual abandonment of the site by the Hudson's Bay Company, is hardly a valid assumption. Further, the use of an arbitrary excavation grid set to magnetic north for the examination of structures that were aligned in a different fashion (and whose provenience was established previously in most cases by Caywood in the 1950s), has led to the combination of materials from interior and exterior activity areas. These techniques ignore the obvious distinctions in deposition between fundamentally different types of activity area.

For the present investigations, the distribution of flat (window) glass, and most of the wood and nails in the undisturbed 19th century Stratum 4 are hypothesized to represent those

materials associated with the use and demolition of the New Office building. Window glass, in general, appears to represent primary refuse associated with the breakage and replacement of windows during the use of the building and those materials associated with the abandonment of the site by the Hudson's Bay Company and subsequent demolition and clean-up by the U.S. Army. Likewise, nails and most of the fragments of wood are hypothesized to have been incorporated into the New Office structure, and their location is largely associated with the structure's demolition. Consistent with those assumptions of past researchers, the distribution of these types of materials, flat glass, nails, and wood, is believed to closely approximate the locations in which they were used. Their distribution is believed to provide direct evidence for architectural details of the New Office.

In contrast, other artifacts recovered from the New Office Investigation in 1999 most likely represent those materials that were discarded outside the structure prior to, during, or after its use. It is unlikely that they were materials incorporated in the building that subsequently were spread to the outside during abandonment and demolition. Rather, these materials appear to represent sheet trash and midden accumulation around the building. Particularly notable is the concentration of refuse associated with Units N35, W275, and N40, W260-270, including Features 9905 and 9906. These deposits contain a diverse assemblage of materials including faunal materials associated with food preparation and consumption activities, ceramic and glass food and beverage vessels associated with both culinary and gustatory functions, armaments, tobacco use, clothing, and discarded construction materials, including bricks. It is quite possible that these materials were deposited during the use of the building, and quite possibly by its occupants. The presence of the slate pencil and stoneware blacking bottle provide tentative ties to the use of the structure as an office inhabited by gentlemen clerks and/or Commander Baillie.

Examination of the density of ceramic artifacts provides a means of exploring these complementary hypotheses further. In Table 11, the density of artifacts (No./ft.^{3}) in Stratum 4 deposits is compared for four types of artifact. The table shows the densest concentration of refuse for each excavation unit for each type of material. As shown in the table, the highest densities of ceramics and vessel glass are found in Units N40, W265, and N40, W270, with Unit N35, W275, exhibiting the third highest artifact densities for ceramics and vessel glass. In contrast, the densities of flat glass and nails, are not exceedingly high for N40, W265-270. Unit N15, W240, which has a very low density of both ceramics and vessel glass, exhibits one of the highest densities of flat glass. Units N40, W265-270 contain relatively high densities of nails, but they are not dramatically different in nail density from the other units. Table 11 shows that Unit N30, W290, contains significantly higher nail densities than any of the other units, while containing only moderate numbers of ceramics, vessel glass, and flat glass. While it is possible that some of the flat glass and nails in the N40, W265-270 units represent secondary refuse that was deposited from elsewhere during maintenance or renovation activities at the fort, it is argued that the majority of the construction materials are derived directly from the New Office and reflect the spatial arrangement of its architectural elements at the time of its use and demolition. The exceptions to this are the roof tiles, which are sparse and appear to be associated with an older structure west of the 1829-36 stockade, and bricks, which appear to represent secondary refuse dumped along the north wall of the New Office building. The spatial arrangement of other refuse, including ceramics and vessel glass, may reflect use by the inhabitants of the structure or may be related to use by others who used the north wall of the New Office as a convenient dump.

TABLE 11. MAXIMUM ARTIFACT DENSITY FOR NEW OFFICE UNITS

	Density† (No./ft^3)			
UNIT	Ceramics	Vessel Glass	Flat Glass	Nails
N15, W240	2.1	5.3	27.9	12.1
N30, W280	3.9	4.7	9.8	10.6
N30, W290	4.5	9.0	9.0	30.0
N35, W275	5.1	9.8	6.6	8.4
N40, W265	14.5	11.9	31.9	14.5
N40, W270	19.1	20.3	28.3	19.9

† The highest density of artifacts for a level associated with undisturbed 19th century deposits (Stratum 4) and excluding feature deposits.

Given this interpretation, the data recovery excavations along the northern edge and northeast corner of the New Office building provide additional information for the proposed reconstruction. Analysis of window glass size and thickness indicates that a number of windows were present on the north side of the New Office. At least two and possibly as many as four windows are inferred. There is not much evidence for a door on the north side of the structure, although the condition of the deposits was somewhat compromised by the use of the area for a road after the flood of 1894. Compacted areas that might be associated with a door would have been destroyed by the road and there is no direct material evidence, such as hardware, that would indicate a door. The only tentative evidence for a door is the concentration of refuse along the central-eastern portion of the north wall which could have been deposited outside a door if Brunswick type refuse disposal (South 1977) was operating at the site. Steele et al. (1975:139) posit such patterning for the Sales Shop where a refuse area was found in association with a hypothesized rear exit. This possibility is intriguing for the New Office as it would directly tie the materials in the refuse deposits to the use of the structure. Unfortunately, the lack of corroborative evidence precludes inference of a northern door.

All three of the partial New Office footings excavated in 1999 exhibited evidence of burning. The remaining portion of Feature 3 was largely intact, while Features 4 and 8 were burnt almost completely away. The numerous artifacts found in association with Features 4 and 8 apparently represent materials that fell down into the footing holes, probably after the fire. While many of the ceramic artifacts found in 19th century deposits contained evidence for exposure to heat, usually in the form of potlids or the complete removal of the slip, there were few melted sherds and almost no melted glass. It is hypothesized that the New Office was demolished sometime around 1866 and that the larger parts were removed prior to the fire. If the structure had burnt, it is likely that large quantities of melted window glass and annealed iron artifacts would have been recovered (as noted by Hibbs [1987:44]). It is possible that the site was burnt only after much of the structure was removed from the area and the artifacts remaining had become buried under a layer of fill. While the fire probably preceded the flood of 1894, the truncation of the flood layer by the Army road precludes determination of the date of the fire. It is possible that the area was burnt after the flood had dropped a protective layer of silt across the area.

RECOVERY BIAS

The current investigations have measured the bias associated with the various collection strategies employed by past researchers. Quantification of materials left behind in the backfill of previous excavations provides a baseline for studying collection bias in the future. This will improve the interpretation of excavation data and permit more efficacious comparisons between excavations. Clearly, Caywood's backfill contains many artifacts, as does the backfill from the 1972 Bakehouse excavations.

A surprising find is that the current excavations recovered almost as many artifacts as the 1986 OAS New Office excavations. A total of 5,637 artifacts was recovered by OAS from 15 5 x 5-ft. excavation units in 1986, while 5,587 artifacts were collected from only 9 5 x 5-ft. excavation units in 1999. Clearly, the use of nested ¼- and ⅛-inch mesh sieves resulted in a significantly higher recovery of artifacts. While these smaller fragments are not always highly diagnostic, it is important to note that the present investigation identified 14 named ceramic patterns from the New Office materials, compared with only 7 for the 1986 OAS work. As noted above, the analysis of artifact size is a means of addressing formation processes, including activity area maintenance, trampling, and other post-depositional effects. The higher recovery of artifacts from the 1999 excavations also may be due to the location of the excavations on the outside of the structure and further outside of Caywood's trenching disturbance. Certainly, however, the probability of recovering beads, buck shot, bird and fish bones, lithic debitage, and other small and important finds are increased with the use of smaller mesh sieves.

CONCLUSIONS

The 1999 excavations in the New Office area have ensured that the entire area of the New Office site and the western portion of the utility corridor have been archaeologically excavated. Additional architectural evidence has been provided with which to more accurately reconstruct the building. Substantial numbers of flat glass, nails and nail fragments, brick, wood and charcoal objects were recovered and analyzed. The results of the analysis suggest that between two and four windows were probably present on the north wall of the New Office, but there is virtually no evidence for a door. Most of the nails, window glass, and wood, were inferred to represent demolition debris associated with the New Office building. Sheet trash and a secondary refuse dump were identified around the edges of the building. The largest numbers of artifacts were recovered in the east-central portion of the north wall of the New Office building in Units N35, W275, and N40, W265-270. These secondary refuse deposits contained a variety of materials, including ceramics, vessel glass, bones, bricks, and other artifact categories. Substantial numbers of artifacts were found all along the north wall of the New Office, however, suggesting that this area generally was used for the casual disposal of refuse. Some of these materials may derive from use of the New Office, but also could represent materials dumped by Hudson's Bay Company personnel who did not customarily use or inhabit the New Office.

An important goal of the excavations was to ground-verify previous archaeological excavations. The current excavations have verified the northeast and southeast corners of the

New Office and placed them and previous excavations in 1986 and 1988 in a global spatial geographic context. The spatial arrangement and positional errors associated with previous excavations has been recorded. This work will contribute to the further identification of precision and accuracy measures for previous excavations at Fort Vancouver, which will assist in the future management of its archaeological resources. Based on the ground-verification work, portions of the eastern part of the utility corridor should be avoided during construction as intact archaeological deposits appear to be present. The western 5 ft. of the corridor appears to be fully mitigated, however. Monitoring of ground disturbing actions in the utility corridor and for the foundations of the reconstruction will ensure that significant intact cultural deposits are not damaged or destroyed.

The excavation of Unit 1 has mitigated the proposed expansion of the water box. Construction impacts should be contained within the 5 x 5 ft. unit that was excavated. It is recommended that any trenching outside of existing trenches conducted for construction of the waterline should be monitored by an archaeologist.

The construction trench associated with the 1966 stockade reconstruction was defined in Unit 2, east of the stockade and Unit 3, west of the stockade. The trench extended 2 ft. east of the concrete footing in Unit 2, but only about 0.5 ft. west of the concrete footing in Unit 3. Substantial numbers of artifacts were recovered from the Stockade Investigation, including brick, ceramics, faunal remains, and wood/charcoal. Many of the materials recovered from Unit 3 appear to derive from the privy excavated in 1972 by Hoffman and Ross. Some of the materials also could be associated with a human burial found directly to the west. Many of the materials located in Unit 2 may also be from the upper portions of the privy disturbed during the construction, use, and demolition of the 1918 Spruce Mill slash burner. The amount of materials and the significance of the materials, including large fragments of ceramics, bones, and vessel glass, suggest that monitoring of construction trenches across previously disturbed areas, including archaeologically excavated areas, may yield valuable materials for the museum collection.

RECOMMENDATIONS

The following recommendations are made to improve the analysis of the materials and to enhance the understanding of the archaeology and architecture of the New Office site:

1. Treatment procedures for bone materials should be determined to prevent degradation of the collected artifacts,
2. Faunal analysis of the bones should be conducted to determine the species represented, butchering techniques, and if human remains are present,
3. Paleobotanical analysis of the wood remaining from the three footing features (Features 3, 4, and 8) should be conducted to identify species and condition as a means for studying Hudson's Bay Company construction techniques at the New Office,
4. A comprehensive excavation map for all New Office excavations, including the 1986, 1987, and 1988, OAS projects, should be compiled to reconcile any errors in the data and to provide a more accurate map of the features associated with the New Office,

5. A detailed spatial analysis of the interior and exterior areas of the New Office area, including the analysis of artifact size and condition, should be conducted to address formation processes across the New Office site, including refuse disposal patterns, trampling, and post-depositional impacts.

In addition, archaeological monitoring of the waterline and New Office construction should be conducted by a historical archaeologist to ensure that significant cultural deposits are not disturbed during ground-disturbing activities. The eastern portion of the proposed utility corridor should be avoided as the cartographic research has identified potentially intact archaeological materials in that area. As a final recommendation, future excavations should use the extant historical and archaeological information to formulate data recovery techniques that specifically address the differences in cultural deposition between building interiors and exteriors and that is geared to the identification and interpretation of formation processes.

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APPENDIX 1: WASHINGTON STATE PLANE COORDINATES FOR THE 1999 INVESTIGATIONS

The following are Washington State Plane coordinates collected by Keith Garnett, Applied Geographer, using a total station registered to the 1972 NPS site datum . Note that the archaeological unit designations for the New Office are consistent with the Oregon Archaeological Society's 1986-1988 excavations but do not reflect the NPS archaeological excavation grid due to a 5 ft. + error in the OAS grid.

Northing	Easting	Elev	Description
NEW OFFICE INVESTIGATIONS			
113228.49	1447034.61	32.58	Northeast corner of N30, W280
113230.65	1447029.96	32.75	Northwest corner N30, W280
113226.83	1447039.21	32.81	Southeast corner of N35, W275
113231.39	1447041.03	32.99	Southwest corner of N40, W270
113236.09	1447042.86	32.77	Northwest corner of N40, W270
113227.60	1447023.36	32.96	Southeast corner of N30, W290
113229.51	1447018.88	33.07	Southwest corner of N30, W290
113234.11	1447020.64	33.11	Northwest corner of N30, W290
113227.80	1447050.41	33.13	Southwest corner of N40, W265
113229.24	1447034.65	32.74	Elevation datum for N30, W280
113196.12	1447064.94	33.02	Southwest corner of N15, W240
113200.71	1447066.58	33.11	Northeast corner of N15, W240
113197.68	1447060.20	33.08	Southwest corner of N15, W240
WATERLINE/STOCKADE INVESTIGATIONS			
113310.37	1447390.72	33.46	Southwest corner of Unit 3
113315.36	1447389.98	33.20	Northwest corner of Unit 3
113316.10	1447394.77	33.62	Elevation datum for Unit 3
113309.32	1447397.00	32.91	Southwest Corner of Unit 2
113310.08	1447401.88	32.90	Southeast Corner of Unit 2
113314.93	1447401.16	33.18	Northeast Corner of Unit 2
113300.80	1447423.03	32.94	Northeast Corner of Unit 1
113302.95	1447418.60	33.02	Northwest Corner of Unit 1
113298.47	1447416.36	32.92	Southwest Corner of Unit 1